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Editor—Henry E. Sigerist

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ORGAN OF THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE AND THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE

Editor—HENRY E. SIGERIST

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AMERICAN DOCTORS AS MEN OF LETTERS

MARION GRACE WALLERSTEIN

"Knowledge of Nature," said Samuel Johnson, "is only half the task of the writer; he must be acquainted likewise with all the modes of life. His character requires that he estimate the happiness and misery of every condition and trace the changes of the human mind as they are modified by various institutions and accidental influences of climate or custom, from the sprightliness of infancy to the despondence of decrepitude; moreover, he must know many languages and many sciences." These are difficult standards which the venerable critic has established for writers, but yet upon thought, how remarkably physicians as a group qualify! From the proverbial, wise old country "doc" to the modern urbanized physician, doctors seem to be better prepared for the literary field than almost any other group. The men of medicine are the ones who are constantly in touch with reality, the basic reality—life and humanity. All over the world, frightened, melancholy, overburdened, eccentric, worried human beings go first to their physician for confidence, sympathy, and security. To the men in whom we have confidence, we completely bare ourselves of external protections and superficialities we have acquired. We frankly and candidly seek advice and courage, assured of understanding and tolerance. Thus the doctor has a view of life that is intimate, vital, and real, and he must be prepared to meet his challenge. It is as important for him to know character as it is

that he know pathology if he is to fulfill himself. Unconsciously or consciously the physician avails himself of many and rich opportunities and represents a veritable well of experience and observation. His field of observation is greatly enlarged, encompassing all humanity and as a result, he has unique opportunities for seeing every aspect of life. Whereas most of the time we deal with people in the mass, the doctor looks only at the individual. He knows emotions and behavior from his intuition, experiences and observations. He witnesses man's response to impulse, man's reaction to his environment; the doctor can observe man on guard and off; he watches individuals take the knocks of life and also sees them scoop in its rewards. This training is all invaluable to him in his role of literary man for both broad experience and observation are prerequisites for fiction writings. The habit of talking to, and trying to help queer, crochety people, not quite themselves, breeds a certain readiness of apprehension, of insight, a quick wittedness and a lively sympathy in doctors. A little sardonic contempt for shoddy character may creep into the doctor but the effects are softened by its fusion with kindness and humor. Also, the training of the doctor along scientific lines and by the scientific method gives him a common sense attitude, an attitude of keeping on guard and sticking close to fact.

Therefore the transition from doctor to novelist or poet is quite natural. Both the writer and the doctor are devoted to the study of life, to all the minuses as well as the plusses of life. They are both vitally concerned with the psychological details of personality, with emotional states and behavior. The springs of individual and human action are their constant study and it is their duty and delight to explore human nature and chart their fascinating discoveries. The background, the training, the experience, the long intimate contact with humanity, the ripe wisdom, quaint tolerance and wholesome sanity of a good doctor; all these ingredients and characteristics mixed together in a doctor's writing give them a rich flavor of humanity synthesized with a reassuring attitude of common sense. The result is a significant contribution to the world's knowledge through the medium of literature.

Surprisingly enough, these " medico litterati " are often the most hard-working and successful in their chosen profession. It is sur-

prising because these men were able to enter upon a second pursuit and follow it so zealously as to achieve success. On the other hand, it is usually the best doctors who are aware of their intimate contact with humanity and the potentialities of it; and it is the ambitious and hard-working doctors who undertake the recording and charting of their explorations. But limiting the field to the best doctors, and further narrowing it down to the best doctors who entered the literary field, even here the divergent use of the literary medium is amazing.

Dr. Richard Clark Cabot and Dr. Joseph Collins both use writing as a means of giving advice and counsel on the basis of their experience and broad observation. Cabot in his beautifully written book *What Men Live By* gives a simple expression of his philosophy of life. He knows the nature of the ills of mankind and he has intimate contact with them. And with this foundation to build on, Dr. Cabot declares that work, play, love, and worship are the four constituents of real life. These, according to the author, are the four things to take you out of yourself and yet at the same time, develop yourself. From close experience with people, Dr. Cabot has realized the great danger to individual stability if there are no goals or ends in life, hence he builds up a system of life with work, play, love, and worship as the *immanent* goals. He writes to the individual as two people sharing common problems, but his amazing insight into reactions and emotions give this reader a slightly prickly feeling of self-conscious awe! Dr. Collins' books don't express his own philosophy of life as much as Dr. Cabot's writings; Collins rather deals with psychological studies of problems in human relations. In *The Doctor Looks at Love and Life* and *The Doctor Looks at Marriage and Medicine*, Collins speaks in a firm, authoritative manner and cautions people as to their conduct and education. Dr. Collins has seen intimately the results of stupidity, bigotry, and selfishness; he has seen the effects on children and on adults. He knows the joy and suffering that result from alcohol; he knows the symptoms and effects of riches and poverty. He is trustworthy, frank, and straightforward and is a man of broad sympathies and great tolerance. In *Taking the Literary Pulse* Dr. Collins shows his consciousness of the unique position a doctor maintains and says that he thinks doctors

should write more than they do because of their unusual opportunities for observation and hence, counsel. In addition to discussing human relations problems, Dr. Collins has proven himself to be one of the ablest literary critics by his books *Idling in Italy* and *The Doctor Looks at Literature*. In both of these works, he displays an amazing amount of scholarship, brilliancy, force and yet sensitivity (especially in *Idling in Italy*).

In addition to using letters as a medium for counsel and aid, Oliver Wendell Holmes is an outstanding example of a doctor using his rich medical background in a more subtle fashion. He fashioned his medical knowledge into prose fiction, essays, and poetry and fashioned it so deftly that it is likely Holmes and his works constitute the highest level of meeting ground between medicine and English literature. In his own particular way, Dr. Holmes is inimitable. His works abound with grace and sympathetic humor and because of this, he excels in familiar verse and the familiar essay. His *Autocrat of the Breakfast Table* is one of the most delightful books I have ever read. It abounds with quaint, whimsical fun, charming humor, and good natured wit, blended with good common sense, ripe wisdom and sound philosophy. It is full of quips, faults, and foibles of the time and the eternal failings of human nature. In the *Autocrat* we meet the "young girl (who) discovers she is in love when her breathing becomes thoracic"! We also read Dr. Holmes' recollections of his days as a chemistry student enveloped by multi-colored and not exactly fragrant fumes. We read the record of life of a man vitally interested in life, a man of strong convictions and a man of zest. He regarded the world and its people from all angles but always with kindness, understanding and urbanity.

But it was not only in familiar essays that Dr. Holmes achieved fame. Both Holmes and Dr. S. Weir Mitchell used their broad medical background as the basis for many novels. Dr. Holmes' greatest and the one which will probably rank as a classic is *Elsie Venner, a Romance of Destiny*. Throughout his writings we never forget that it is a doctor who holds the pen. His novels present the case from a medico-psychological view and can be classified as "novels with a purpose." Dr. Holmes set before himself the task of solving the problem of pre-natal and hereditary influences upon

the individual. Elsie Venner is the daughter of a woman who had been bitten by a rattlesnake before her child was born. The mother died at childbirth and the child, Elsie, was partially endowed with a serpent nature from birth. She becomes a menace and danger to all who surround her. And it is through this innocent victim of a poison that Holmes tests the doctrine of original sin. In addition to very deftly developing the main trend of the novel, Holmes brings his patient into contact with a typical country doctor, Dr. Kittredge, who proves to be a very amusing side-light. Holmes treats this American institution humorously and confronts him with the usual incidents that confront a physician. Kittredge is a shrewd old man "who looked pretty keenly into his patients through his spectacles, and pretty widely at men and women and things in general over them." And mirrored in the picture of Dr. Kittredge, we get an excellent view of the author and his outlook.

Dr. Mitchell is the other physician who used the novel as the literary medium for conveying his message. He entered the literary field because of his natural aptitude for it and in addition because he felt that "the doctor is improved as a doctor by growing great in other lines as a means of mental diversion." He was one of the greatest physicians this country ever produced and at the same time he made a prominent mark for himself in the literary field. He has a distinctive style and the literary workmanship in his novels is excellent. This is especially evident in *The Red City,* one of Mitchell's best historical novels. It deals with the period of Washington's second administration and is full of the color of the period. Dr. Mitchell has the ability to capture the spirit of the times about which he is writing and this pervading spirit helps to unify and give meaning to all the material. Throughout his novels, Dr. Mitchell has injected descriptions of doctors, patients, epidemics, and historical events of great interest. He displays a great versatility of mind and interest and also a lively imagination. *The Case of George Dudlow,* for example, is an amazing bit of fantasy. George Dudlow is a doctor soldier who loses both legs and an arm in battle. As a result of this he feels that he has lost part of his consciousness. In an effort to regain his complete self, he turns to a new religion, one of the frenzy variety, and sincerely believes that through the new

religion he will rejoin the lost members of his "corporeal family in another and happier world." Dr. Mitchell treats the whole situation with a "straight face" which makes the book very effective reading. The latter characteristic is applicable to the greater part of his writings.

Two modern American doctors have achieved a double fame for themselves through their unusual compositions and innovations in the field of poetry. Dr. Merrill Moore and Dr. William Carlos Williams have both broken away from the standard poetic tradition and are doing new and startling things with poetic form, meter, and content. Dr. Moore explains his entrance into the literary field by saying, "I think I am most interested in human personality and its problems, and it is on that common interest in my own life that medicine and poetry meet." But also his medical experience affords him many opportunities for contact with all kinds of people and situations, and as Dr. Moore admits, "suggestion is the medium for my poems. . . ." He has the peculiar faculty of being able to grasp the essence of a situation in a fleeting moment and to jot it down in a free and bizarre sonnet form. *The Six Sides to a Man* conveys a sense of vitality and zest, something indefinable, but clearly American. His poetry is full of spontaneity and naturalness and together with this, many amazing flashes of insight.

Dr. Williams is extremely interested in the technical problems of modern verse. He claims that the use of the American language is essential for modern American poetry and that poems must contain a perfect fusion of form and content. Dr. Williams has undertaken the task of trying to discover a form appropriate to America. He is primarily interested in things American and in imagery, the phase of realism he employs. His *Collected Poems* show the great variety of subjects Williams covers. They create a feeling on the part of the reader of getting a fleeting but yet direct glance at the subject. They also display the successful fusion of romanticism and realism, a task worthy of only as able a poet as Dr. Williams. His poetry seems to me to exemplify perfectly this excellent definition: "Poetry is the record of the beauty and implications which sensitive, observant men have salvaged from life. . . ."

In conclusion it is hardly necessary to indicate further the rich

and varied contribution which doctors have made to American literature. The close relationship and interplay between the two fields of medicine and literature is very significant and the results, successful and valuable. After gathering this material, I am inclined to agree with Dr. Francis Brett Young when he declares, " If ever a parent were to ask my advice as to what to do with a son who wanted to be a man of letters, my answer would be to give him a Doctor's education."

THE BEGINNINGS OF HOSPITALS IN THE UNITED STATES

JOHN E. RANSOM

The social institutions and organizations which man establishes and maintains are one measure of his progressive development. They reflect not only his creative ability to plan for self-protection and well-being, but afford some basis of evaluating the social, economic, political, philanthropic and scientific forces that were at work at the time these institutions and organizations were first established, and of the evolution of those forces as he improves and makes more useful and efficacious these instruments which serve his developing needs. If we are to appraise them accurately, we must not lift them out of the matrix in which they have taken shape, nor consider them apart from the time, the place, and the social, economic and political atmosphere in which they were created and have been developed.

Thus, if we are to understand and appreciate the evolution of the modern hospital, we must follow the course of its early prototype as it emerges from among the institutions which gave succor to the homeless, the friendless, the wayfarer and the infirm, to become a specialized institution for the care of the sick, the training of physicians and the promotion of scientific medical research. We must know something of the status of various aspects of social life at the time of the birth of this early medical institution and of the several forces which have influenced its development from that early day, even until now. If we can anticipate the future evolution of those forces, we can, in a measure, forecast what the hospital of the future will be.

We must be able to perceive that the hospital never has been nor is now a static thing, but that today, as always, it is being molded and modified by the same forces that brought it into being, kept it plastic to the changing needs of a developing society, and caused it to use the increasingly more effective instruments and techniques which man has invented and perfected as he has advanced in knowl-

edge and skill. Creation is an evolutionary process. Man and his institutions were born, and while they live, they grow.

Today, we consider hospitals so essential to our safety and well-being, that it is difficult to appreciate that the hospital, as a medical institution, is of relatively recent origin. It is younger than the church, the school, the court of law, the prison, the almshouse, the orphanage and the library. This is chiefly because the hospital is an organization of facilities by means of which physicians employ their knowledge and skill in attempting to solve problems related to certain abnormalities of body and mind and in devising means and methods of safeguarding and promoting human health. Consequently, the development of the hospital is conditioned by the development of medical science and its application primarily to the diagnosis and treatment of the diseases which afflict mankind. The status of hospitals at a given time reflects the status of medical science and practice at that same period.

Thus, if we are to seek an answer to the question of why the date of the establishment of the oldest hospital in the United States is one hundred and forty-four years later than that of the first English settlement in America, we will find it first in the status of medical science and practice between those dates. There were other factors as well, but this was primary. Most of the early settlers established themselves on farms rather than in towns. Up to the time of the Revolutionary War there were in all British America hardly more than four towns larger than villages. Even today, with rapid transportation and instant communication, hospitals do not thrive in villages and rural areas.

With the exception of the Dutch in New York and the Swedes in Delaware, most of the early settlers came from England, and though there were among them Cavaliers from whom certain first families of Virginia and other southern states are proud to claim descent, and Puritans of whom others of us boast as our spiritual if not physical forebears, more of these early pioneers were recruited from the English peasantry and from the poorer elements of England's urban population. They brought with them to America, the traditions, the prejudices, the habits of thinking and living which were theirs in the mother country. These traditions, prejudices,

and habits, modified by new-world experience and knowledge, constituted the mental capital of their American-born sons and daughters.

In order that we may have in mind the medical and hospital components of this mental capital of these early Americans, let us consider briefly the status of medical science and practice in England during the seventeenth century and the first half of the eighteenth and take a look at her hospitals of those days.

In England, the seventeenth century was not marked by many noteworthy achievements in medical science. Its outstanding figures are William Harvey, who published his discovery of the circulation of the blood in 1628, and Thomas Sydenham, who made valuable contributions to our knowledge of scarlet fever and other communicable diseases. This century saw the beginning of the employment of the microscope and the therapeutic use of magnesium sulphate and quinine. A distinguished layman, Sir Christopher Wren, is said to have suggested to Robert Boyle the possibility of intravenous medication. John Floyer began counting the pulse.

Boswell [1] tells us that young Samuel Johnson, afflicted with the king's evil, was, on the advice of this Dr. Floyer, taken by his mother to London, where he was touched by Queen Anne. The treatment was unsuccessful.

The outstanding contribution at the very end of the eighteenth century was that of Edward Jenner in substituting vaccination for inoculation against small pox. John Fothergill, of whose contribution to medical education and hospitals in America we shall speak later, and John Huxham, who carried on some research in epidemic fevers, deserve mention. John Hunter was only beginning his work in 1750, and William Cullen and John Brown flourished chiefly after that date.

Sir Thomas Clifford Allbutt, Regius Professor of Physic in the University of Cambridge, writing on Medicine in the Eleventh edition of the Encyclopedia Brittanica says:

> . . . While the great anatomists, physicists and chemists—men of the type of Willis, Borelli and Boyle—were laying foundations which were later

[1] Boswell's Life of Johnson, edited by George Birkbeck Hill, Oxford, 1887, Vol. I, pp. 42-3.

built up into the fabric of scientific medicine, little good was done by the premature application of these principles to practice. The reform of practical medicine was effected by men who aimed at, and partly succeeded in, rejecting all hypotheses, to the unbiased study of natural processes, as shown in health and disease.

Much of medical practice was afforded by physicians who had received little scientific training. Apothecaries and barbers were active and successful competitors of physicians and surgeons. It was an age during which myth, superstition and credulity had greater influence than truth and scientific fact. Sickness might be caused by spells cast by witches many of whom were burned or hanged for their evil deeds. The scrofulous sought the royal presence to be cured by the King's Touch.

If seventeenth century medical practice was poor, that of the eighteenth was worse. Dr. Victor Robinson, in his Story of Medicine,[2] says:

Eighteenth-century England is remembered as the Golden Age of Quackery, a situation due largely to the wretched creatures, male and female, who sat on the throne and patronized charlatans. Queen Anne, suffering from weak eyes and a weaker understanding, insulted the medical profession and turned her country into a Paradise of Quacks by transforming a mountebank into Sir William Read, principal oculist to her majesty.

But the great mass of the English population was too poor of purse to employ either quacks or physicians of good repute. When they were sick they usually doctored themselves or let nature take its course. They made wide use of medicinal herbs and like their long line of unschooled ancestors discovered and demonstrated the medicinal value of many plants of their own fields and forests, and purchased from the apothecary botanical remedies imported from foreign shores.

For centuries before the beginning of English settlement in America, England had been a country of many hospitals. Mediaeval England with a population less than that of modern London had upwards of 750 charitable institutions, many of which were called hospitals. But with rare exception these institutions were not hospitals in the modern use of that term. The hospital was a hospice and only

[2] The Story of Medicine, by Victor Robinson, M. D., New York, 1931, p. 342.

incidentally cared for the sick. Rotha Mary Clay, in her Mediaeval Hospitals of England, says:

> It will be well to make clear what the hospital was and what it was not. It was an ecclesiastical, not a medical institution. It was for care rather than cure; for the relief of the body when possible, but pre-eminently for the refreshment of the soul. . . . Faith and love were more predominant features in hospital life than were skill and science.[3]

Of these hospitals, more than two hundred were or had been occupied by lepers. Some were chiefly houses of hospitality for strangers, important institutions during the period when pilgrimage was widespread. Others were general hospitals which afforded temporary or permanent shelter to needy persons of many sorts and conditions. Many of these institutions had outlived their usefulness and been closed before the dissolution of the religious houses and the confiscation of their property by Henry VIII. Few of them provided much that we can call medical care. They housed the sick but could do little to cure their maladies. However, several of these early English hospitals provided care for women in childbirth. William Gregory of London,[4] in his commonplace book says of "Bartholomew ys spetylle: Hyt ys a place of grete comforte . . . and yn specyalle unto young wymmen that have mysse done that ben whythe chylde. There they ben delyueryde, and unto the tyme of puryfycacyon that have mete and drynke of the placys coste, and full honestely gyded and kepte." It is doubtful if the obstetrical care provided was on a par with the guiding and keeping.

St. Bartholomew's, founded in 1123 by Rahere, the court minstrel who became a priest, and St. Thomas', founded about 1200, were outstanding institutions, both of which weathered the storm of Henry's despoliation, and were the only general hospitals in all England during most of the period of the colonization of America.

Even these institutions, in the earlier centuries of their existence were hardly hospitals as we use the term today. Sir D'Arcy Power, in his Foundations of Medicine, says of St. Bartholomew's—"The hospital was less fortunate on the medical side. The need for a physi-

[3] The Mediaeval Hospitals of England, by Rotha Mary Clay, London, 1909, Introduction.

[4] *Ibid.*, Chapter I.

cian was not felt for some years, and when one was at last appointed, he was that Dr. Lopez, the Portuguese Jew, who was hanged, drawn and quartered in 1594, for encompassing the death of Elizabeth." Evidently in that day it behooved a physician to cure his patient, particularly were she of royal blood.

Of the early service of these hospitals, we may get some idea from a poem written by Robert Copeland in 1535 or 36, entitled The Highway to the Spital House.[8] This poem describes a visit to a London hospital, probably St. Bartholomew's and is made up in part of a dialogue between the author and the Porter or Admitting Officer of the institution. In answer to Copeland's question—" Who hath of you relief? " the Porter replies:

> Forsooth, they that be of such mischief,
> That for their living can do no labour,
> And have no friends to do them succour,
> As old people, sick and impotent,
> Poor women in childbed, have here easement,
> Weak men sore wounded by great violence
> And sore men eaten with pox and pestilence,
> And honest folk fallen in great poverty,
> By mischance or other infirmity,
> Wayfaring men and maimed soldiers
> Have their relief in this poorhouse of ours;
> And all others which we seem good and plain
> Have here lodging for a night or twain,
> Bedrid folk and such as cannot crave
> In these places most relief they have,
> And if they hap within our place to die
> They are buried well and honestly;
> But not every unsick stubborn knave,
> For then we should over many have.

The eighteenth century was an age in which philanthropy expressed itself in Great Britain by the establishment of many institutions for the care of the poor and the helpless. It was particularly marked by the erection of a large number of hospitals in England, Scotland and Ireland. In London, Westminster Hospital was established in 1720, Guy's in 1724, St. George's in 1733, the London Hospital in 1740, and three maternity hospitals between 1739 and

[8] The Elizabethan Underworld, prepared by A. V. Judges, London, 1930, p. 5.

1750. The Bristol Royal Infirmary was opened in 1735, the Liverpool Royal Infirmary in 1745, and the Manchester Royal Infirmary in 1752. In Scotland, the Royal Infirmary of Edinburgh was founded in 1736 and that of Aberdeen in 1739. In Ireland, several Dublin hospitals date from 1718 to 1745.

These hospitals were established and long maintained by voluntary contributions and though they existed for the purpose of providing hospital care for the poor and the homeless, many abuses in the form of restrictions, fees and bribes, crept in.

Garrison, in his History of Medicine,[6] speaking of 18th century hospitals, says—

> Hospital management was bad in the 17th century the world over. It was worse in the 18th. There was the same overcrowding; several patients occupying one bed or pallet, the same absence of ventilation, the same presence of vermin and filth, the same lack of appreciation of the need for isolation of contagious diseases, the same misdirected effort at nursing, the same fatal issue following every attempt at major surgery.

It is unlikely that many of our early settlers had been patients in hospitals in their native land. These pioneers did not as a rule establish themselves in towns and villages. Most of them became farmers and as there were few doctors, the people usually treated themselves when sick, employing the remedies they had used in England and learning of others from the Indians. Medicinal herbs were widely used. Women cared for each other in childbirth. Men with some mechanical skill reduced fractures and set broken bones. Clergymen sometimes ministered to sick bodies as well as to sinful souls.

The settlement of America was accomplished slowly. There were 168 years between the first English settlement at Jamestown in 1607 and the outbreak of the Revolutionary War; 155 years between Plymouth Rock and Bunker Hill. No census was taken until 1790, but there was a listing of British subjects in the several Colonies in 1755. This gives a total population of the 13 American Colonies of 1,046,000 exclusive of Negroes, Indians and British soldiers. This is 1⅓ times as many people as lived in Cleveland, Ohio, in 1940. In 1790, New York City was about the size of present-day Lexington, Kentucky, having a population of 49,401; Philadelphia

[6] History of Medicine, Fielding Garrison, M. D., p. 417.

with 28,522, compares with Burlington, Vermont; Boston's 18,320 made it about the size of Fort Lauderdale, Florida, and Baltimore with 13,503 was of the size of the 1940 Annapolis.

These facts and conditions are sufficient explanation of the reason why practically no hospitals were established in the Colonies before the Revolutionary War.

Our early needs for other than military hospitals, which needs will be mentioned later, were those which first became apparent in the towns which were later to develop into our Atlantic seaboard cities.

The first hospital to be established in the territory which later became the United States of America was in what is now New York City. In 1658, at the suggestion of Master Jacob Hendricksen Varrevanger, Surgeon to the Dutch West India Company, a hospital was erected for the care of sick soldiers, who previous to that date had been billeted on private families. It also served the negro slaves of the Dutch West India Company. New York City, then called New Amsterdam, had a population of about 1,000, of whom a considerable number were negro slaves. In 1680, this hospital building, then known as the "Old Hospital" or "Five Houses," was sold and a new and more modern building erected in its place.

All of the larger towns in the Colonies were seaports and all of them—Boston, New York, Philadelphia, and Charleston—faced the necessity of establishing isolation hospitals, pest houses, or quarantine stations in which patients suffering from contagious diseases, especially small-pox, might be cared for. The purpose of these institutions was primarily the protection of the well and only secondarily the care of the sick. Samuel Drake's History of Boston and Antiquities,[7] published this quotation from the archives of the town of Boston, May 15, 1717, "The Selectmen are authorized to lease land on 'Dere' Island, not exceeding one acre for a Hospital or Pest House, but for a period not to exceed 99 years."

In 1738, the Province of Massachusetts erected a hospital on Rainsford Island in Boston Harbor for the reception of such persons as might be visited with any contagious sickness. It was controlled

[7] The History and Antiquities of Boston, by Samuel Drake, A. M., Boston, 1856, p. 604, footnote.

by the town of Boston and the Province. The General Court enacted a statute requiring " that the commanding officer at Castle William, and the Keeper of the Light-house, shall notify and direct the Masters of all vessels coming near them, wherein any infectious sickness is or hath lately been, at their coming in, to come to anchor as near the afore-mentioned House as may be, that the sick persons, and everything else on board said ship that might give infection, may be removed into it with the greater ease and safety." [8]

We know that there was a pest house in Charleston prior to 1752 for there is a record that in that year a hurricane flooded the city and among its damaging effects, carried the Sullivant's Island pest house several miles up the Cooper River, drowning nine people. It would be interesting to know whether or not it continued to function in its new location. There was a similar institution in New York City in 1757. Philadelphia's early pest house on Fisher's Island was established in 1742.

The care of patients who were being inoculated against small-pox was another purpose for which early hospitals were established, particularly in New England.

Inoculation against small-pox was introduced into America through the efforts of the Rev. Cotton Mather and Dr. Zabdiel Boylston. A small-pox epidemic broke out in Boston in 1721. It is difficult for us who have the protection of vaccination to appreciate the horror and fear which such an epidemic created. Cotton Mather had in some way learned about the practice of inoculation in England. Dr. Boylston was a successful Boston practitioner. Mather urged Boylston to try inoculation. In June, 1721, he inoculated his 6-year-old son and two Negro servants. There were protests voiced by other physicians, the press, and the public. Boylston later published an account of his experience with inoculation. He stated that in the epidemic of 1721-22 there were 5,759 cases of small-pox in Boston with 844 deaths—a mortality rate of 14 per cent. There were 286 patients inoculated against the disease with six incidental deaths—less than 2 per cent. After the success of this method of immunization had been demonstrated, small hospitals for the care of patients recovering from the effects of inoculation were established in many towns.

[8] *Ibid.*, p. 556.

On Boylston's death, Dr. Thomas Aspinwall took up the work. He had a private hospital in Brookline. When vaccination was developed as a safer and more effective immunization procedure than inoculation, Aspinwall recognized its superiority, gave up the practice of inoculation and closed his hospital.

Inoculation hospitals were established in several other of the Colonies. Dr. Henry Stevenson operated one in Baltimore; several were opened in Charleston in 1763. There were several in Virginia in 1779. In the August 8, 1800, issue of the *Virginia Argus*, James Walker made the following announcement: "The fall inoculation for Small-pox will begin at my hospital in the County Buckingham. Prices a guinea for whites, fifteen shillings for blacks." [9]

Dr. Uriah Rogers, Jr., of Norwalk, Conn., maintained such a hospital. His advertisement in the *Connecticut Courant* of November 30, 1767, reads in part as follows:

> Dr. Uriah Rogers, Jr., of Norwalk, County of Fairfield, takes this method to acquaint the Publick & particularly such as are desirous of taking the Small Pox by way of Inoculation, that having had Considerable Experience in that Branch of Practice and carried on the same the last season with great Success; he has lately erected a convenient Hospital for that purpose just within the Jurisdiction Line of the Province of New York about nine miles distant from N. Y. Harbour, where he intends to carry said Branch of Practice from the first of October next to the first of May next. And that all of such as are disposed to favour him with their Custom may depend upon being well provided with all necessary accommodations, Provisions & the best Attendance at the moderate Expense of Four Pounds Lawful Money to Each Patient.[10]

There were at least two private or proprietary hospitals in Virginia prior to the Revolution. Blanton, in his Medicine in Virginia in the eighteenth century, says:

> One of the early private hospitals in Virginia was conducted by Col. Jesse Brown, said to have been an 'accomplished surgeon whose death was universally regretted.' Our knowledge of this hospital is limited to mention of it in Purdie and Dixon's *Virginia Gazette*, for January 3, 1771, where an advertisement stated that Dr. Brown's son, Dr. Samuel Brown, had moved

[9] Medicine in Virginia in the Eighteenth Century, by Wyndham B. Blanton, M. D., p. 286.

[10] The Practice of Medicine in the New England Colonies, by Francis R. Packard, M. D., reprinted from the Journal of the A. M. A., May 7, 1898, p. 10.

to Southampton County and proposed to continue the operation of his father's hospital and to practice surgery there.

Dr. William Cabell, who died in 1774, conducted a hospital near his home in Amherst County and made a specialty of surgery, attaining considerable reputation as an amputator of arms and legs.[11]

In 1734, the Vestry of St. Philip's Parish, South Carolina, in which parish, Charleston, then a town of five or six hundred houses, was located, petitioned the governor for permission to bring in a bill " for appropriating as much of the square Piece of Ground belonging to the Publick in Charlestown, as may be necessary whereon to erect proper Buildings for the use of a Public Work-house and Hospital, and for authorizing your Petitioners to Erect such Buildings on the same at their own proper Cost and Charge. . . . Parish Officers are now often obliged to take up with very poor Accommodations of Lodging, &c, for Sick Persons, and at extravagant Price, to the great trouble of such officers, Suffering of the Sick Persons, and enhancement of the Parish Charge." [12]

Prior to this time it had been the custom in South Carolina to provide for sick persons in the private homes of citizens and to pay out of parish funds sums agreed upon for their board, room and nursing care. Evidently parsonages were occasionally used as hospitals. A French minister at St. James, Santee, is quoted as expressing his dissatisfaction with this custom in these words: " I am obliged without charity to assist the sick poor people and to keep physic to cure her. Some time these be at my charge two months before she recovered her health."

The petition of the St. Philip's Vestry resulted in the passage of an Act authorizing it to raise a maximum of 2,000 pounds for the current year and 1,000 pounds annually thereafter and to construct thereon a " good, substantial, and convenient Hospital, workhouse and House of Correction."

This is an early example of the custom of housing in the same building or in adjacent buildings on the same grounds, patients, paupers and prisoners, a system which may have some merit from

[11] Blanton (see 9 above), p. 296.

[12] St. Philip's Hospital in Charlestown in Carolina, by Joseph Ioor Waring, M. D., Annals of Medical History, New Series, Vol. IV, No. 3, pp. 283-289.

the point of view of financial economy but which has many undesirable features. It is a system which has persisted in some localities down to the present day and interferes with the full use of the hospital facilities in such a setup. This is because of the fact that in the minds of many people the stigma that attaches to being a resident of the almshouse or the prison attaches itself to being a patient in the hospital.

This hospital was probably opened in 1738 and thus antedates by 13 years the Pennsylvania Hospital, the institution which has the most valid claim to being the oldest, though of course not the first, hospital in the United States.

St. Philip's Hospital had a very interesting history much of which is recorded in the unpublished account book of the Vestry of the St. Philip's Church. It seems to have served mostly chronic patients. By 1789, the care of the poor had passed from the hands of the Church into those of the Civil Authorities and after that date there is no mention of the hospital in the archives of the parish. Consequently, the date of the discontinuance of its service to the sick is not known.

The Pennsylvania Hospital is quite generally recognized as the oldest institution for the care of the sick in the United States. It owes its existence largely to the efforts of two men, though many others helped. These two gentlemen, neither of whom was a native Philadelphian, are Dr. Thomas Bond and Benjamin Franklin.

Thomas Bond was born in Calvert County, Maryland, in 1712. He began the study of medicine with Dr. Alexander Hamilton in Annapolis. There was no medical school in the Colonies and unless a young man who planned to become a physician had sufficient money with which to go abroad to study in one of the English or continental schools, he studied with some local practitioner until he thought he had acquired enough knowledge to enable him to begin practicing; he then hung out his shingle and began. There was no hospital in which he could take an internship. He did not need a license to practice for none was required. The first act to regulate the practice of medicine and surgery was a local ordinance of New York City, enacted in 1760; New Jersey followed with a similar regulation in 1772. He could not use a medical library for there was

none until in 1762 when one was established in the Pennsylvania Hospital. He did not read medical journals, nor belong to a medical society—there were none. If he had forethought and industry he probably planted a garden of medicinal herbs and from them prepared many of the medicines he used. When he became sufficiently well known and successful to attract apprentice students he used their time in the early stages of their training to compound the drugs and medicines which he used and perhaps sent them to the woods and fields to gather Jimpson weed for his asthmatic patients, poke berries for the treatment of chronic sores, sour dock for the itch, blackberry roots, dogwood bark, elderberries and goldenrod for dysentery, juniper berries for worms, boneset for ague and consumption and the roots, bark, leaves and fruit of many other plants. He used his medicines very liberally on the assumption that if a little was good, a lot was better. It was only as homeopathy later became a rival school of medical theory and practice that the overdosing of patients began to abate.

The father of Thomas Bond, being evidently a man of means, sent both Thomas and his brother Phineas to study in medical schools in England, Scotland, and in Paris. These schools were affiliated with hospitals and young Bond learned the value of institutional provision for the care of the sick. He made the acquaintance of the wealthy and able Quaker physician, John Fothergill, who was later to help him and William Shippen establish America's first hospital and earliest medical school.

Returning to America, Bond set himself up as a general practitioner in Philadelphia in 1734. His brother Phineas joined him four years later.

Bond felt that there ought to be a hospital in Philadelphia and began to try to interest his friends and acquaintances in the idea. There were not the same incentives to hospital building then as now. There were really only two motives that could be appealed to, philanthropy and protection. No one thought of a hospital for private patients. Such an institution was only for the poor, the homeless, and the stranger. Then there were lunatics who if institutionalized would be less dangerous to the community. Bond, though a good doctor, was evidently not the man to arouse sufficient public

interest in his project to enable him to secure the necessary money. But he did have the good sense to seek out the one man among his friends who could put it across. That man was Benjamin Franklin, the most prominent citizen of Philadelphia, if not of America as a whole. In his autobiography, Franklin tells how he did it.

In 1751, Dr. Thomas Bond, a particular friend of mine, conceived the idea of establishing a hospital in Philadelphia (a very beneficent design, which has been ascribed to me, but was originally and truly his) for the reception and cure of poor sick persons, whether inhabitants of the province or strangers. He was zealous and active in endeavoring to procure subscriptions for it; but the proposal being a novelty in America, and at first not well understood, he met with but little success.

At length he came to me with the compliment, that he found there was no such thing as carrying a public-spirited project through without my being concerned with it. 'For,' he said, 'I am often asked by those to whom I propose subscribing. 'Have you consulted Franklin on this business? And what does he think of it?' And when I tell them I have not (supposing it rather out of your line) they do not subscribe, but say, they will consider it.' I inquired into the nature and probable utility of the scheme, and receiving a very satisfactory explanation, I not only subscribed to it myself, but engaged heartily in the design of procuring subscriptions from others. Previously, however, to the solicitation, I endeavored to prepare the minds of the people by writing on the subject in the newspapers, which was my usual custom in such cases, but which he had omitted.

The subscriptions afterwards were more free and generous; but beginning to flag, I saw they would be insufficient without some assistance from the Assembly, and, therefore, proposed to petition for it; which was done. The country members did not at first relish the project; they objected that it could only be serviceable to the city, and, therefore, the citizens alone should be at the expense of it; and they doubted whether the citizens themselves generally approved of it. My allegation to the contrary, that it met with such approbation as to leave no doubt of our being able to raise two thousand pounds by voluntary donations, they considered as a most extravagant supposition and utterly impossible.

On this I formed my plan; and asked leave to bring in a bill for incorporating the contributors according to the prayer of their petition, and granting them a blank sum of money; which leave was obtained chiefly on the consideration that the House could throw the bill out if they did not like it. I drew it so as to make the important clause a conditional one, viz.: 'And be it enacted by the authority aforesaid, that when the said contributors shall have met and chosen their Managers and treasurer and shall have raised by their contributions a capital stock of two thousand pounds value, the yearly interest of which is to be applied to the accommodation of the sick poor in

the said hospital, and free of charge for diet, attendance, advice and medicines, and shall make the same appear to the satisfaction of the speaker of the Assembly for the time being; that then it shall and may be lawful for the said speaker, and he is hereby required to sign an order on the provincial treasurer, for the payment of two thousand pounds in two yearly payments, to the treasurer of the said hospital, to be applied to the founding, building and finishing of the same.

This condition carried the bill through; for the members who had opposed the grant, and now conceived they might have the credit of being charitable without expense, agreed to its passage; and then in soliciting subscriptions among the people, we urged the conditional promise of the law as an additional motive to give, since every man's donation would be doubled; thus the cause worked both ways. The subscriptions soon exceeded the requisite sum, and we claimed and received the public gift, which enabled us to carry the design into execution. A convenient and handsome building was soon erected, the institution has by constant experience been found useful, and flourishes to this day, and I do not remember any of my political manoeuvers, the success of which at the time gave me more pleasure; or wherein, after thinking of it, I more easily excused myself for having made some use of cunning.[18]

Assured of the necessary funds, the Managers set out to secure a site and build the hospital plant. Since the Penn family owned much land in Philadelphia, an appeal was made to them for a suitable plot of ground. The Penns were unwilling to give the plot which the Managers had requested but offered another which was declined as it was a swampy tract adjacent to a brickyard. The Managers then spent five hundred pounds of their capital for the land on which the hospital now stands, to which the Penns, several years later, gave an adjacent strip completing the square, Eighth to Ninth Streets between Spruce and Pine.

They decided not to wait the erection of a building before beginning to care for the physically and the mentally ill. In 1751 they rented a house for forty pounds a year, spent one hundred fifty pounds to recondition it, hired a nurse or maid at ten pounds per annum, appointed Doctors Thomas and Phineas Bond and Lloyd Zachary to serve as medical staff without pay, and opened this, the oldest hospital in what is now the United States.

[18] The Life of Benjamin Franklin, written by Himself, edited by John Bigelow, Philadelphia 1874, Vol. I, p. 295 ff.

One of the Managers drew the plans for the new building for which three thousand pounds was expended for construction and furnishing. It was completed in the fall of 1756 and on December 17th of that year the patients were transferred to the new quarters. The inscription on the cornerstone reads as follows:

IN THE YEAR OF CHRIST
MDCCLV
GEORGE THE SECOND HAPPILY REIGNING
(FOR HE SOUGHT THE HAPPINESS OF HIS PEOPLE
PHILADELPHIA FLOURISHING
(FOR ITS INHABITANTS WERE PUBLICK SPIRITED)
THIS BUILDING
BY THE BOUNTY OF THE GOVERNMENT
AND OF MANY PRIVATE PERSONS,
WAS PIOUSLY FOUNDED
FOR THE RELIEF OF THE SICK AND MISERABLE;
MAY THE GOD OF MERCIES
BLESS THE UNDERTAKING

The Pennsylvania Hospital was but fifteen years old and had been occupying its new building scarcely eight years when the opening guns of the Revolutionary War were fired in Massachusetts. Even before hostilities developed in the Philadelphia area, the hospital began to experience difficulties incident to the war. The Proprietary Government of Pennsylvania came to an end in September, 1776. The laws which had governed the Province were abrogated and a brief interregnum followed before they were temporarily reenacted by the General Assembly of the new Commonwealth. Current income of the hospital was reduced as was the value of its capital. Capital funds had to be used to meet expenses of operation and debts incurred. Obligations to the institution were paid in money of questionable value. In 1777, several of the most active and efficient members of the hospital's Board of Managers, together with other Quaker conscientious objectors, were placed under arrest and interned at Staunton, Virginia. Later the problem of the depletion of essential hospital personnel by the demands of government for their military service became serious and we find the Managers petitioning the General Assembly for exemptions from militia fines and military duties of the Steward, the Apothecary and the Cell-Keeper. These requested exemptions were granted by special statute.

As to military uses of the hospital's facilities, the first wounded soldiers sent by the Committee of Safety were admitted in December, 1776. In January, 1777, wounded soldiers, sailors and Hessian prisoners were received.

A British army entered Philadelphia on September 26, 1777. It took possession of the hospital and used it for the care of their sick and wounded. On their departure in June, 1778, the British military authorities appropriated blankets, bedding and instruments for which the hospital never received compensation. Following this evacuation the hospital was used until the end of the war by the Continental authorities for the care of their own sick and wounded and for that of prisoners of war. In 1778 an agreement was entered into with the Medical Department of the Continental Army for the use of the hospital's pharmaceutical " Elaboratory " for the preparation and compounding of medicines for the use of the military hospitals.

Another hospital in Philadelphia has some validity for its claim to be the oldest hospital in the United States. In 1728 the Overseers of the Poor of Philadelphia petitioned the Provincial Assembly for assistance in providing institutional facilities for the care of the increasing numbers of poor persons resident in or who were coming to the city. The petition was granted by a loan to the Mayor and Commonalty of Philadelphia of one thousand pounds " to be applied to the purchase of ground and the erection of an Almshouse for the use of the poor of the city." It was erected in 1731 or 32. A hospital or infirmary for the care of both the physically and the mentally ill was established in connection with this almshouse, from which developed the Philadelphia General Hospital.

On May 16, 1769, in Trinity Church, New York City, were held the graduating exercises of the recipients of the first medical degrees conferred by King's College, later known as Columbia University. The principal speaker was twenty-seven year old Samuel Bard, Professor of the Practice of Medicine in that college. Young Dr. Bard, like Thomas Bond, had studied medicine in London and Edinburgh. On the recommendation of Dr. Fothergill he had been appointed an assistant to Dr. Russell at St. Thomas's Hospital.

In the course of his commencement address he said:

. . . It is truly a reproach, that a City like this, should want a Public Hospital, one of the most useful and necessary charitable Institutions that can

possibly be imagined. The laboring Poor are allowed to be the Support of the Community; their Industry enables the Rich to live in Ease and Affluence, and it is from the hands of the Manufacturer we derive not only the Necessaries, but the Superfluities of Life; whilst the poor pittance he earns will barely supply the Necessities of Nature, and it is literally by the sweat of his Brow, that he gains his daily Subsistence; how heavy a Calamity must Sickness be to such a Man, which putting it out of his Power to work, immediately deprives him and perhaps a helpless Family of Bread!

Nor would the good Effects of an Hospital be wholly confined to the Poor, they would extend to every Rank; and greatly contribute to the Safety and Welfare of the whole Community. Every Country has its peculiar Diseases; . . . and these Peculiarities with their Antidotes can properly be learned only in public Hospitals, where having a numbeer of Sick at one Time, not only affoards an Opportunity of the better comparing of their Symptoms, but they being under a certain Discipline and Regulation, the Faces of the Diseases are not changed, either by the indulgence of friends or the officiousness of Nurses; which is too often the case in private practice. Another argument (and that by no means the least) for an institution of this Nature, is, that it affoards the best and only means of properly instructing Pupils in the Practice of Medicine; as far therefore as the breeding good and able Physicians, which in all Counties and at all Times has been thought an object of the highest Importance, deserves the Consideration of the Public, this Institution must likewise claim its Protection and Encouragement.

Nor is the Scheme of a Public Hospital I believe so impracticable, nor the Execution of it, I hope at so great a distance, as at first sight it may appear to be. There are Numbers in this Place I am sure (was a Subscription once set on foot upon an extensive and generous Plan) whose Fortunes enable them, and whose Benevolence would prompt them, liberally to contribute to so useful an Institution; it wants but a Prime Mover, whose Authority would give Weight to the Undertaking, and whose Zeal and Industry, would promote it. Such a one I hope to see rise up amongst us, and may the Blessing of the Poor, and the Applause of the Good and Humane, be the Reward of his Assiduity and Labour.[14]

Immediately following these exercises, at the suggestion of Governor Sir Henry Moore who had attended the Commencement, a subscription was opened for funds for a hospital, the sum thus raised amounting to nearly one thousand pounds. Through the efforts of the Earl of Dunmore, Governor Moore's successor, a charter was granted by George III to the Society of the New York Hospital in the City of New York in America.

[14] Medical Education in Early New York, by Samuel Bard, M. D., New York 1921, p. 15 ff.

A campaign for funds was organized with committees in each of the city's seven wards, the clergy were asked to present the appeal from their several pulpits, merchants in England and Ireland interested in trade with the province were solicited, Dr. Fothergill named in the charter as one of the Governors of the institution and Sir William Duncan, physician to the Queen, were asked to help, and Governor Tryon was petitioned to recommend to the Provincial Assembly that it make a grant to the proposed hospital. Drs. Samuel Bard, Peter Middleton, John Jones and Malachi Treat were appointed to its staff.

Construction of a hospital building on a site on the West side of Broadway opposite Pearl Street was nearing completion when disaster befell the undertaking. In its March 6, 1775 issue, the *New York Gazette* and *Weekly Mercury* says: "On Tuesday last, between twelve and one o'clock, the new hospital at Ranelagh, a large pile of buildings lately erected and nearly finished, was discovered to be on fire, the workmen being all gone to dinner, and the whole wooden part of the building, was, in about one hour, reduced to ashes."

Undaunted, the Governors raised more money and proceeded to rebuild. The structure was again nearing completion when on the second of April, 1776, the New York Provincial Congress commandeered it for barracks. Late in August, 1776, New York City was evacuated by the Continental Army. The British Military Authorities used the hospital plant for barracks for their Hessian troops. Following the termination of the war the buildings were put to several different uses such as housing destitute immigrants and for meetings of the State Legislature. Finally on January 3, 1791, a resolution was passed by the Board of Governors for opening the hospital and receiving patients.

It is of some significance that both Pennsylvania Hospital and the New York Hospital were founded not only to care for the sick but as well to provide facilities for the teaching of medicine and that both institutions provided for mentally-ill as well as physically-ill patients, at first treating both types in the same institution but later establishing separate mental units. The founders of both hospitals included physicians who had been trained in England and

were familiar with English hospitals. Both were assisted by Dr. John Fothergill.

The credit for founding the first state-supported hospital for the care of persons with mental diseases, is due in large measure to one man, Sir Francis Fauquier, Governor General of His Majesty's Colony of Virginia, who seems to have been familiar with the hospitals of England, such as Bedlam, which are publicly supported. In his annual speech on Thursday, November 6, 1766, he addressed the House of Burgesses in these words: "It is expected I should also recommend to your consideration and humanity, a poor unhappy set of people, who are deprived of their senses and wander about the country terrifying the rest of their fellow creatures. A legal confinement and proper provision ought to be appointed for these miserable objects."

This eloquent appeal was received by the Burgesses with humble thanks, and on November 20, 1766, a resolution was passed "That a Hospital be erected for the reception of persons who are so unhappy as to be deprived of their reason." It was also ordered "That the Committee of Proposition and Grievances do prepare and bring in a bill or bills pursuant to the above resolution." However, no action was taken. In his speech in adjourning the House, on April 11, 1767, the Governor quoted the resolution of the previous session in regard to this, and stated that since that time nothing had been done about it. This move of Sir Francis brought the desired result, as on June 4, 1770, Mr. Bland presented to the House, according to order, a bill to "make provision for the support and maintenance of idiots, lunatics and other persons of unsound minds." The bill was received and read the first time and about three days later, June 7, 1770, was passed.

Prior to the Revolution of 1776, which dissolved the relations between the parish vestries and the state, the custody of the pauper insane and the relief of the poor in Virginia, belonged to the vestries of the Established Church, which was the Church of England. That the Colony early felt the dependence of these unfortunates upon her bounty is clearly shown by an act passed by the House of Burgesses in the tenth year of the reign of George III, 1769, entitled "An Act to Make Provision for the Support, Maintenance of Idiots, Lunatics and Other Persons of Unsound Mind."

" The Public Hospital for Persons of Insane and Disordered Mind," which had thus been incorporated, was, as a result of this act, opened for the reception of " idiots, lunatics and persons of unsound minds," on October 12, 1773. This hospital, now known as the Eastern State Hospital, and located at Williamsburg, is the oldest hospital in the United States to be used exclusively for the care of the insane.

The General Assembly placed the creation of the institution in the hands of distinguished citizens: Thomas Nelson, Jr., was one of the signers of the Declaration of Independence, served with distinction in the Revolutionary War, and was Governor of Virginia in 1781; George Wythe was a signer of the Declaration of Independence, and Professor of Law at William and Mary College; Peyton Randolph was President of the first Continental Congress in 1774; others were Benjamin Waller, John Blair, William Nelson, John Randolph, Dudley Diggs, and John Tazewell. A purchase of land was made from Thomas Walker who later bequeathed it to the Court of Directors, and upon it was erected a building two stories high. The plan was furnished by Robert Smith of Philadelphia, and its date reads April 9, 1770. The 1,200 pounds originally appropriated not being sufficient to purchase the land and complete the buildings, the General Assembly in February, 1772, passed an act authorizing the treasurer of the Colony to pay to the Court of Directors " a further sum, not exceeding 800 pounds, to be by them applied towards finishing the said hospital, making enclosures for the patients to walk and take air in, after their reception, and defraying the other incidental charges." On September 14, 1773, at a meeting of the Court of Directors, the president informed the court that the hospital was completed, whereupon the court proceeded to examine the said hospital, and finding it finished according to agreement, it was received by Benjamin Powell, the " undertaker." At the same meeting James Galt was appointed keeper of the hospital, and he was referred to the general assembly for such salary as his services should be thought to merit.

On October 12, 1773, the first meeting of the Court of Directors for the reception of patients was held. Two cases were taken into consideration, one from the County of Hanover and the other from

the County of New Kent. The court being of the opinion that they were persons of insane and disordered minds, they were received in the hospital. At this meeting the keeper of the hospital was ordered to call on Dr. John DeSequeyra "to visit such persons as shall be brought to the hospital on their first reception, and at such other times as may be necessary."

From the time of its incorporation up to 1841, the institution was known as the "Public Hospital," sometimes as the "Lunatick Hospital," and at times spoken of as the "Mad House." There is now in the library of William and Mary College a map of the City of Williamsburg, dated 1780, on which the hospital is designated as the "Mad House of Bedlam." By an act of the legislature, passed on March 6, 1841, the name was changed to the Eastern Lunatic Asylum, and not until February 22, 1894, was the name changed to the Eastern State Hospital. The hospital was the first in this country to care for the colored insane as well as white patients.

Virginia early recognized the need for a marine hospital. Before 1705, Lt. Gov. Alexander Spotswood had "urgently recommended that a hospital with every convenience obtainable in those times should be built as a part of the fort at Point Comfort for the use of sailors needing medical or surgical attention." I quote the following from Blanton's *Medicine in Virginia* in the eighteenth century:[15]

> On April 15, 1708 the council ordered 'that a house be hyred for accommodation of the sick men belonging to her Majesty's Ship, the *Garland* and that the Rent of the said house be paid out of her Majesty's Revenue of two shillings per hogshead and it is recommended to Collo. William Wilson to provide a house accordingly.'
>
> However, it was not until 1780 that steps were taken to establish a permanent marine hospital. In that year the Commonwealth of Virginia by act of its Assembly provided for the establishment of a hospital for sick and disabled seamen by a direct tax on sailors and mariners. Nothing more was done until 1787, when another act provided that 'whereas that the tax imposed on seamen hath produced a fund sufficient for the purpose of erecting a hospital' the Governor be authorized to appoint 7 commissioners to erect a hospital at Washington, Norfolk Co. Work on the hospital was accordingly started but from the beginning its funds were inadequate. In 1790 the Assembly authorized the sale of the building. Apparently no purchaser was found for in 1794 a tax of 30 cents for the support of the hospital was levied on every sailor who entered ports of the State.

[15] Blanton, *op. cit.*, p. 289 ff.

In spite of the tax the finances of the institution remained in a deplorable condition, and in the same year, James Taylor, Sr., wrote the Governor on behalf of the Commissioners, urging prompt action by the Assembly, to meet the deficiency in funds which had prevented the completion of the work and had made it impossible for the Commissioners to keep their contract with the builder. Even then, apparently, the funds were not forthcoming, for an act of 1798 offered to cede the building to the United States for a marine hospital if the Federal Government would pay the balance due on the contract. In 1800 the government accepted the hospital on the conditions proposed by Virginia, and it became the first federal institution of its kind in the country.

The hospital was operated by the United States government until the War between the States, when the Confederates took it over and used it as barracks. At the evacuation of Norfolk it fell into Federal hands and was converted by them into an army hospital. It continued to serve this purpose until the Fall of 1862. After that the building seems to have remained in disuse until 1875. In that year, under an act of Congress of 1866, which provided for the sale of all marine hospitals whose admission rate had fallen below 20 cases per annum, it was sold by the Secretary of the Treasury.

From its very beginning at Ferry Point, Va., the marine hospital movement has expanded until today (1931) there are 26 first class marine hospitals in the United States, caring annually for nearly 400,000 patients. Although the celebrated Greenwich Hospital in England was established at an earlier date, it was essentially a military institution designed to serve the Royal Navy exclusively. The Ferry Point institution not only was the oldest marine hospital in the country, but marks the beginning by the United States government of a service whose efficiency and organization have been admired and copied on two continents.

The first occasion for any considerable need for hospital service in America was the outbreak of the Revolutionary War in 1775. Though the revolt against England had been brewing for a number of years, the actual beginning of hostilities found the American Colonials in many ways unprepared. Not the least of the unpreparedness was their almost total lack of well-trained physicians and surgeons and the supplies and equipment needed to set up temporary hospitals for the care of sick soldiers and the casuals of battle. Some of our military officers and a few doctors had had experience with the British Army in the wars fought on American soil between English and French armed forces. The British Army had a well developed medical and hospital service. It was logical that this should be the pattern on which the early American military hospital

system was planned. The British military hospital system consisted of what were then called flying hospitals, but later, field hospitals which were tents set up close to the field of battle for first aid and essential emergency surgery. From these the wounded were evacuated to regimental hospitals at some distance behind the lines, and from them to general hospitals which might be still further removed from combat areas. In the regimental and general hospitals those who became sick in camp were hospitalized. Naturally, the first hospitals were established in and around Boston, the scene of the opening hostilities of the war.

The Battles of Lexington and Bunker Hill resulted in casualties demanding surgical treatment. Houses in Cambridge and other villages suburban to Boston were commandeered and converted into hospitals. Like in most other wars, however, more of the soldiers in our armies during the Revolutionary War needed medical and hospital care because of illnesses incidental to camp life than required surgical treatment of wounds sustained in battle. The hospital system and service developed during our long struggle for independence had no great influence on the development of our civil hospital system and is of sufficient historic interest to merit separate treatment.

There is a long story of lack of competent physicians and surgeons and of medical and hospital supplies, of political interference, malfeasance in office, professional jealousy, inefficiency and graft, all of which conditions the development of this our first organization of military hospital service. But there is also another long story of planning and operating those early temporary hospitals under conditions of great difficulty, of professional ingenuity when essential medicines and surgical instruments were lacking, of devotion to the care of the sick and wounded, of carrying a heavy load when others shirked, of which the medical department of the Army may be justly proud. Fortunately, Shakespeare to the contrary notwithstanding, we emulate those of our ancestors who were patriotic, loyal, and efficient, and try to forget those who were not.

Though the beginnings of our military hospital system were not particularly significant, the organization of the medical department of the U. S. Army which dates from these same Revolutionary War

years, has largely followed the pattern which we borrowed from the British Army and adapted to our own conditions and needs.

So far as hospital service is concerned, we did not much profit by the experience gained during the War for Independence. When in less than 35 years after the close of that war we were again in armed conflict with England in the War of 1812, the hospital service and facilities provided for our soldiers and sailors were as bad or worse than those of Revolutionary war days. Dr. James Mann in his Medical Sketches of the Campaigns of 1812-13 and 14, says—"The medical, with other departments of the army, at the commencement of the war, wanted a system. Military hospitals were to be formed by gentlemen, little versed in hospital establishments for an army. These were evils, the necessary consequence of our civil polity, and long period of peace, and which all new military establishments have to encounter." [16]

As to the beginnings of hospitals in Maryland, it is probable that provisions were made for housing patients who came to drink the waters of Ye Coole Spring at Charlotte Hall in St. Mary's County. The vestry book of St. Peter's Parish, New Kent County, Virginia, contains this entry under date of March, 1698-9—"It is ordered by this present vestry that Capt. John Lydall carry Anthony Borrows in his sloop to the Springs in Maryland and provide such necessaries for him as he shall think fitt; and to be paid for his charge and trouble at the laying of the next Levy." [17] Dr. J. Hall Pleasants read a paper before this Club in October, 1903. His subject was—The Second Hospital in the Colonies The "Coole Springs of St. Maries," Maryland, 1698.[17a] He quoted from the archives of Maryland certain acts of the General Assembly, 1698 and 1699, providing for the purchase of the Springs and the adjoining land and for the erection thereon of buildings or tenements "for the good and benefit of such poor Impotent and lame persons as shall resorte thither." However, Dr. Pleasants presented no evidence that these buildings were

[16] Medical Sketches of the Campaigns of 1812, 13, 14, by James Mann, M. D., A. A. S., Dedham 1816, p. vi.

[17] The Vestry Book of St. Peter's, New Kent County, Va., 1682-1758; 1905, p. 48.

[17a] The Second Hospital in the Colonies, The "Coole Springs of St. Maries," Maryland, 1698. The Johns Hopkins Hospital Bulletin, Vol. XV, No. 154, Jan. 1904.

erected, and if they were, one may question whether they could properly be called a hospital.

In February, 1769, Dr. Henry Stevenson advertised in the Maryland Gazette that he was converting part of his mansion on Parnassus Hill near Baltimore as an inoculation hospital.[18] In June, 1794, a hospital was opened at Hawkins Point "to receive sick coming from infected ports." [19]

In November, 1797, the Maryland Legislature passed an act authorizing the erection in or near Baltimore of a hospital for indigent sick and lunatics, and in January, 1798, appropriated $8,000 for that purpose.[20]

In February, 1798, the Baltimore City Council authorized the purchase of a 6¾ acre site for this hospital at the corner of Broadway and Monument Streets for the sum of $300.[21] This hospital was known as the City, Public or Maryland Hospital and was later relocated at Catonsville where it is known as Spring Grove State Hospital, the second oldest State institution of its kind in America.

In the beginnings of hospitals in the United States we find our colonial forefathers, faced with problems the solution of which called for an organization of facilities, adapting to their use the type of institution already in existence in other lands. They made use of such knowledge and skill as were available. They improved these early hospitals which they established, modifying them as conditions changed, increasing their value and usefulness as medical science and practice developed. From the simple humble beginnings which they made has developed the American hospital system of today which is ours not only to use but to support and to further develop.

[18] The Medical Annals of Baltimore, by John R. Quinan, M. D., Baltimore, 1884, p. 14.

[19] *Ibid.*, p. 19.

[20] *Ibid.*, p. 20.

[21] *Ibid.*, p. 21.

THE EARLY MEDICAL HISTORY OF SARATOGA SPRINGS

HENRY E. SIGERIST

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Balneology has not only a European but also an American tradition. The balneological literature written in this country can be traced back to the 18th century when one mineral spring after another was discovered and investigated. I plan to write a series of articles on the early history of American balneology and on the physicians who played a prominent part in the opening up of the nation's spas. Little research has been done on the subject so far, and writers have been more attracted by the social than by the medical history of our watering places. The field is new to me and gaps will undoubtedly be found in the first articles, but I hope to be able to fill them in gradually while the series proceeds.

1. *The Saratoga Springs from their Discovery to 1793*

The land was wilderness when in the summer of 1767 friendly Indians carried Sir William Johnson to the High Rock, the earliest known of the Saratoga springs. It was part of the large Patent of Kayaderosseras which in the beginning of the century had been granted by Queen Anne to a company of colonists, but the region of the spring had not been settled as yet. The road from Albany to the north followed the Hudson River, and west of it was forest, teeming with animal life, rich hunting grounds.

The Indians knew the spring. On the foot of a high rock, a hard cone filled with bubbling yet cold water could not escape their attention. They must have wondered at this unusual sight and one day they found that the water had healing properties.

Sir William Johnson was suffering from the results of a wound contracted years before during the French and Indian War. Living with the sister of a Mohawk chief, Sir William was a warm friend of the Indians, and when they saw him suffer they brought him to the

Medicine Spring of the Great Spirit at Saraghoga, the Place of Swift Water. He spent some time there in a hut such as the Indians used to erect during the hunting season, took the water and recovered his strength so well that according to the tradition he was able to walk back to Schenectady.

Dr. Samuel Tenney, the first physician who wrote about the Saratoga springs, does not mention Sir William's journey. He wrote in 1783[1] that the springs "were unknown (except to the Mohawks in whose country they are found) 'till about thirteen years ago; at which time they were discovered by some surveyors."

At any rate there can be no doubt that the spring became generally known to the white man around 1767-1770. In the latter year a physician of Schenectady, Dr. Constable was said to have visited the spring and to have examined the water.[2] If he did, it seems that he did not leave any written record.

In 1773 the first settler, Dirck Schouten, came and built a log cabin not far from the High Rock spring. His intention was to trade with the Indians and also to provide accommodations for visitors, but he apparently did not get on with the Indians and left at the end of the first season.

The following year another settler, John Arnold, came with his family and took possession of the deserted cabin. He opened a tavern and traded with the Indians who had sixteen huts, all in sight of Arnold's cabin. "These Indians were principally employed in hunting and fishing, and although frequently intoxicated" — thanks to Arnold's trade — "they were generally inoffensive and friendly."[3]

John Arnold spent two summers at the spring, but then he too abandoned the cabin. When Dr. Steel was preparing his book on Saratoga, a son of Arnold, Thomas Arnold, was farming in Stillwater, eight miles from the springs. From him Dr. Steel received a graphic account of what the region had been like in the years 1774-1775: "The valley along the brook was covered by large trees of hemlock, elm and maple; and the bank on the west side of the valley

[1] *Memoirs of the American Academy of Arts and Sciences*, Boston, 1793, vol. II, part I, p. 43.

[2] John H. Steel, *An analysis of the mineral waters of Saratoga and Ballston* . . . , Saratoga Springs, 1831, p. 37. The first edition was published in 1817.

[3] *Ibid.*, p. 32.

with a thick growth of overgrown white pine, while the opposite side was a perfect thicket of yellow and pitch pine . . . The woods abounded with wild game. Bears, deer, wolves and moose were seen almost every day; and the small stream which runs through the valley was the abode of beaver and great quantities of salmon trout."[4] A second spring, Flat Rock Spring, was known at that time.

In 1776 a new settler, Samuel Norton, occupied the cabin, cleared up the land and was determined to make the place a success, but it was a year of great events. The Declaration of Independence had been adopted, the Revolutionary War was on, and General Burgoyne was marching along the Hudson. After only eleven months Norton joined the British army and it seems that from 1777 to 1783 no white man lived at the springs.

Peace was signed between the United States and England in 1783, and the year became an important one for the Saratoga springs also. A son of Samuel Norton came back and took over where his father had left. Illustrious visitors came. General Philip Schuyler spent several weeks during that summer at the springs in a walled tent, and he liked the region so much that he came back the following year, built a cottage, the first frame house of the place, to which he returned every summer. With Schuyler came a still more illustrious visitor, General George Washington, who was much impressed by the springs and their potentialities, recognizing that they were totally different from the Virginia springs. He even thought for a moment of purchasing the grounds.

The same year 1783 saw the first medical account of the Saratoga waters written, although it was not printed until ten years later. It came from the pen of Dr. Samuel Tenney.

Dr. Tenney (1748-1816)[5] was born at Byfield, Mass., graduated from Harvard in 1772, studied medicine with Dr. Thomas Kittredge of Andover and began practising medicine at Exeter when the Revolutionary War broke out. On the day of Bunker Hill, he joined the army and served as a regimental surgeon until the end of the war, first with the Massachusetts, later with the Rhode Island troops.

[4] *Ibid.*, pp. 30-32.

[5] See Howard A. Kelly and Walter L. Burrage, *Dictionary of American Medical Biography*, New York, 1928.

He was present at the battle of Saratoga and visited the springs while he was stationed at Fish creek.

On September 1, 1783 Dr. Tenney wrote from Saratoga an account of his experiences with the springs and addressed it to Dr. Joshua Fisher who was a fellow of the American Academy of Arts and Sciences in Boston. The letter was published ten years later under the title:

An Account of a Number of Medicinal Springs at Saratoga, in the State of Newyork, by Dr. SAMUEL TENNEY

in the Memoirs of the American Academy of Arts and Sciences, vol. ii, part i, pp. 43-61, Boston 1793.

It is a very interesting document which begins:

Dear Sir,

You may probably recollect, that the last time I had the pleasure of seeing you, I mentioned some mineral springs, in the vicinity of this place, which I had not then seen. I joined the regiment soon after, and took the first opportunity to visit them; and, I assure you, I never had less reason to repent of any pains taken to gratify my curiosity in my life. They are such a production of nature as is calculated, not only to attract the notice, and excite the admiration of the illiterate; but to engage the attention of the physician, the chemist, and the philosopher.

Dr. Tenney was aware that the springs might have a great future when he said:

They have been considerably frequented by the poorer sort of people, ever since their discovery; but for want of medical directions, and necessary accommodations, their usefulness has been hitherto much confined. I think they want only a suitable introduction to the world, and some convenient houses for boarding and lodging patients, to render them, under the advice of judicious physicians, of very important service to the country. Whether my expectations are too sanguine, time will discover.

He then described the springs of which he had seen about ten, and discussed their location. He, of course, had tasted the water:

Their taste is (apparently) acido saline, and much the same in all the springs mentioned. Though the taste itself is not pleasant, yet the impression which the water makes on the organs of taste, as it passes over them, is very lively, pungent, and agreeable; like that of good bottled beer or cider: and after drinking freely of them, I usually had eructations of the same pungent,

stimulating gas, as is produced by drinking those liquors. Unpleasant as their taste is at first, habit not only renders them tolerable; but to most persons very agreeable. Most of the invalids whom I sent to the waters, drank them after a short time with great avidity, to the amount of several gallons in a day: and some of the most intemperate of them assured me, with great seriousness, that they preferred them to any kind of spirits.

Tenney was keenly interested in science and later wrote a number of studies on various subjects of physics, chemistry and agriculture. It is no wonder that he felt anxious to analyze the waters, but wanting proper chemical apparatus he had to limit himself to a few simple experiments. He boiled the water and examined the residue, "a greyish insipid powder." Sulphuric acid produced a strong effervescence and Tenney concluded that the residue consisted mainly of "impure calcareous earth," or calcium salts as we would say.

Sulphuric acid added to the water produced a violent effervescence for a short time. After it had subsided, "the water lost its natural milky hue, and became as transparent as common water; its acidity was increased, but not in proportion to the quantity of acid that had been added." Salt of tartar, or potassium carbonate, dissolved immediately and produced a precipitate without giving the water an alkaline taste.

From these two experiments Tenney concluded that the calcium salts were probably suspended in the water by means of "fixed air," or carbon dioxide. He recognized that the various springs were not essentially different, but in one of them — "a very small one, situated on the other side of the brook, discharging not more perhaps than a barrel of water in twenty four hours"—he found a large amount of iron and pronounced it a strong chalybeate. His method of ascertaining it was primitive enough. Having no nutgalls, he used some shavings of white oak bark. "The decoction was transparent, and of a reddish brown: to one part of this I added two parts of the water; the mixture became immediately of a dark brown, and lost its transparency."

Tenney considered the Saratoga springs similar to the waters of Pyrmont, Seltzer, etc. but superior on account of their being more strongly impregnated with carbon dioxide. He sent about eighty patients, sick soldiers from his regiment, to the springs, and found that rheumatic disorders reacted particularly well. "Indeed I am

disposed to believe, as well from the accounts of the people in the vicinity, as from my own observation, that in the chronick rheumatism, the waters are a very certain cure."

Two patients with greatly tumefied, indurated and painful livers caused by an obstinate jaundice recovered their health in a short time. Tenney described a number of other cases and recorded not only successes but also failures. He was convinced, however, of the medicinal virtues of the Saratoga waters and concluded that "nothing but a series of accurate observations by ingenious practitioners, can determine all their properties and excellencies."

Tenney was aware that his analysis of the water was very inadequate, and he particularly regretted that he had been unable to make a quantitative analysis. He wished that others would continue where he had left off. "It may afford," he said, "an agreeable amusement to any gentleman of ability and leisure, to prosecute these inquiries."

Such a gentleman of ability came a few years later, in 1787: Samuel Latham Mitchill (1764-1831, Fig. 1) who was to become one of America's foremost chemists.[6] When he visited the springs he was not yet the famous professor, but a young doctor who had just graduated from the University of Edinburgh. All early writers on Saratoga report that Mitchill analyzed the waters, although we have no signed publication on the subject.[7] Two short anonymous articles appeared, however, in 1788 in *The American Museum, or Repository of ancient and modern fugitive pieces, etc. prose and poetical. Philadelphia: Printed by Mathew Carey, vol. IV, pp. 40-42*, and we have Valentine Seaman's testimony[8] that these articles were Mitchill's work. This is corroborated by a passage in a pamphlet published under the title *Some of the memorable events and occurrences in the life of Samuel L. Mitchill, of New-York, from the year 1786 to 1822* which seems to be Mitchill's own work[9] and where we read under number 2:

[6] Courtney Robert Hall, *A scientist in the early republic, Samuel Latham Mitchill, 1764-1831*, New York, 1934.

[7] See Mitchill's bibliography in Courtney Robert Hall, *l. c.*

[8] *A Dissertation on the mineral waters of Saratoga*, New York, 1793, p. vii.

[9] C. R. Hall, *l. c.*, p. 150 lists *Some of the memorable events and occurrences in the life of Samuel Latham Mitchill, 1786-1826*, New York, 1826 under "Non-Scientific Writings of Mitchill." The pamphlet listed by Hall must be a second

Visits Saratoga Springs while surrounded by the forest, and ascertains experimentally, that the gas extricated from the water was fixed air,[10] with the power to extinguish flame, destroy the life of breathing animals, etc.—1787.[11]

The two articles furthermore were reprinted in the early editions of *The American Geography* by Jedidiah Morse[12] and the second article is introduced with the sentence: "The following curious experiments made on these waters were extracted from Dr. Mitchill's Journal." I think there can be no doubt as to the authorship of the papers.

Since both articles are very short I would like to reprint them here as early documents to the history of the Springs:

Description of the mineral springs of Saratoga

They are eight or nine in number, situated in the margin of a marsh, formed by a branch of Kayadarossora creek, about twelve miles west from the confluence of Fish Creek and Hudson's River. They are surrounded by a rock of a peculiar kind and nature, formed by the petrefaction of the water. One of them, however, more particularly attracts the attention; it rises above the surface of the earth five or six feet, in the form of a pyramid. The aperture in the top, which discovers the water, is perfectly cylindrical, of about nine inches diameter. In this, the water is about twelve inches below the top, except at the time of its annual discharge, which is commonly in the beginning of summer. At all times, it appears to be in as great agitation as if boiling in a pot, although it is extremely cold. The same appearances obtain in the other springs, except that the surrounding rocks are of different figures, and the water flows regularly from them.

By observation and experiment, we found the principal impregnation of the water is a fossile acid, which is predominant in the taste. We also found it strongly impregnated with a saline substance, which is very discernable in the taste of the water, and in the taste and smell of the petrified matter about it. From the corrosive and dissolving nature of acid, the water acquires a chalybeate property, and receives into its composition a portion of calcareous earth, which, when separated, resembles an impure magnesia. As the different springs have no essential variance in the nature of their waters, but the pro-

edition of the pamphlet of 1822 of which the William H. Welch Medical Library possesses a copy.

[10] Both terms *fixed air* and *aerial acid* were used at that time to designate carbon dioxide.

[11] This passage is quoted in John H. Steel's book, *l. c.*, p. 38.

[12] First edition: London 1789, 2nd ed. London 1792.

Fig. 1.

Samuel Latham Mitchill
1764-1831

portions of the chalybeate impregnation, it is rendered probable that they are derived from one common source, but flow in separate channels, where they have connexion with metallic bodies, in greater or less proportions.

The prodigious quantity of air contained in this water, makes another distinguishing property of it. This air striving for enlargement, produces the fermentation and violent action of the water before described. After the water has stood a small time in any open vessel (no tight one will contain it) the air escapes: it becomes vapid, and loses all that life and pungency which distinguishes it when first taken from the pool. The particles of dissolved earth are deposited as the water flows off, which, with the combination of the salts and fixed air, concrete and form the rocks about the springs.

The effect it produces upon the human body is various; the natural operation of it, when taken, is carthartic: in some instances an emetic. As it is drank, it produces an agreeable sensation in passing over the organs of taste; but as soon as it is swallowed, there succeeds an unpleasant tang, and the eructations which take place afterwards, have a pungency very similar to those produced by the use of cyder or beer in a state of fermentation.

Experiments on the mineral waters of Saratoga

A young turkey, held a few inches above the water in the crater of the lower spring, was thrown into convulsions in less than half a minute; and, gasping, shewed signs of approaching death; but on removal from that place and exposure to the fresh air, revived, and became lively. On immersion again for a minute in the gas, the bird was taken out languid and motionless.

A small dog, put into the same cavity, and made to breathe the contained air, was in less than one minute, thrown into convulsive motions—made to pant for breath—and lastly to lose entirely the power to cry or move; when taken out, he was too weak to stand, but soon, in the common air, acquired strength enough to rise, and stagger away.

A trout recently caught, and briskly swimming in a pail of brook water, was carefully put into a vessel just filled from the spring; the fish was instantly agitated with violent convulsions, gradually lost the capacity to move and poize itself, grew stupid and insensible, and in a few minutes was dead.

A candle repeatedly lighted and let down near the surface of the water, was suddenly extinguished, and not a vestige of light or fire remained on the wick.

These experiments nearly correspond with those usually made in Italy, at the famous grotto del cane, for the entertainment of travellers; as mentioned by Keysler, Addison, and others.

A bottle filled with the water and shaken, emits suddenly a large quantity of aerial matter, that either forces out the cork, or makes a way beside or through it, or bursts the vessel.

A quantity of wheaten flour, moistened with this water, and kneaded into

dough, when made into cakes, and put into a baking pan, rose, during the application of heat, into light and spungy bread, without the aid of yeast or leaven.

From which it appears, that the air extricated from the water, is precisely similar to that produced by ordinary fermentation.

Some lime-water, made of abalactiles brought from the subterranean cave at Rhinebeck, became immediately turbid, on mixture with the spring water; but when the water had been lately drawn, the precipitate was quickly re-dissolved.

Some of the rock surrounding the spring, on being put into the fire, calcined to quick-lime, and slacked very well.

When the aerial matter has evaporated, the water loses its transparency, and lets fall a calcareous sediment.

Whence it is true, that the gas is aerial acid, that the rock is lime-stone, and that by means of the former, the water becomes capable of dissolving and conveying the latter.

Mitchill's analysis is anything but profound, and rather reflects the casual observations of a travelling young scientist, but his experiments with animals are interesting and the two articles deserve notice because they represent, to my knowledge, the first printed reports on the nature of the Saratoga water.

When Mitchill visited the Springs in 1787 the whole settlement, outside of Schuyler's two-room cottage, still consisted of only one log cabin, the one that Schouten had built in 1773. In 1787 it changed hands twice. Norton sold it to Gideon Morgan who the same year sold it to Alexander Bryan. Bryan remained at the Springs until his death and is therefore considered the first permanent settler. Visitors were coming in increasing number, and there was much demand for accommodations. Bryan therefore built a new and larger log cabin, specially designed to serve as tavern and for the accommodation of visitors.

In 1789 two new settlers came to the Springs, Gideon Putnam who built a farm and saw mill and who was to play a very important part in the development of the place, and Dr. Clement Blakesley, Putnam's brother-in-law who took residence in the old Schouten cabin. It seems that Blakesley did not stay on and the cabin was purchased in 1790 by Benjamin Risley, Putnam's and Blakesley's father-in-law.

Thus in 1791 Saratoga Springs consisted of plenty of water and

three log cabins. How primitive conditions were is graphically described by Theodore Dwight. In his *Summer Tours; or Notes of a Traveler through Some of the Middle and Northern States*[13] he relates the experience of a friend of his, a lady who had travelled to the Springs in 1791:

> On reaching the Springs at Saratoga, we found but three habitations, and those poor log-houses, on the high bank of the meadow, where is now the western side of the street, near the Round Rock. This was the only spring then visited. The houses were almost full of strangers, among whom were several ladies and gentlemen from Albany; and we found it almost impossible to obtain accommodations, even for two nights. We found the Round Rock at that time entire; the large tree which some years since fell and cracked a fissure in it being then standing near, and the water, which occasionally overflowed, and increased the rock by its deposits, keeping the general level three or four inches below the top. The neighbourhood of the Spring, like all the country we had seen for many miles, was a perfect forest; and there were no habitations to be seen in all the vicinity, except the three log-houses, which afforded us little more than a shelter. We arrived on Saturday, and left there on Monday morning for Ballston, which we reached after a short ride. But there the accommodations for visitors were still less inviting. The Springs, of which there were several, were entirely unprotected, on the borders of a woody swamp, and near the brook, in which we saw bubbles rising in several places, which indicated other springs. There were two or three miserable habitations, but none in which a shelter could be obtained. There was a small hovel, into which some of the water was conducted for bathing; but as there was nothing like comfort to be found, we proceeded homeward after spending a short time at the place.

In 1792 the Congress Spring was discovered which was to become the social center of the spa. And then in 1793 a young New York physician published the first monograph on the mineral waters of Saratoga.

2. *Valentine Seaman's Dissertation of 1793*

Valentine Seaman (Fig. 2) was born on April 2, 1770 in North Hempstead, Long Island, the fourth son of a New York merchant Willet Seaman.[14] He studied medicine with that colorful New York

[13] New York, 1847, p. 110.

[14] For the biography see Stephen W. Williams, *American Medical Biography*, Greenfield, Mass., 1845, pp. 509-512.—Howard A. Kelly and Walter L. Burrage, *l. c.*, p. 1088.

Fig. 2.

Valentine Seaman
1770-1817

doctor Nicholas Romayne and became resident physician at the City Almshouse. He then went to the University of Pennsylvania, heard Benjamin Rush who made a great impression on him, and took his M. D. in 1792, publishing a dissertation *On Opium, Philadelphia, 1792, Johnston and Justice, 32 pages, 8°.*

The same year he took a trip to the northern part of the State of New York, whereby he visited and analyzed the springs of Saratoga. The results of his observations were published in 1793 in New York[15] under the somewhat cumbersome title (see Fig. 3):

A Dissertation on the Mineral Waters of Saratoga; Containing, *a topographical description of the country, and the situation of the several springs; an analysis of the waters, as made upon the spot, together with remarks on their use in medicine, and a conjecture respecting their natural mode of formation:*

Also, *a method of making an artificial mineral water, resembling that of Saratoga, both in sensible qualities and in medicinal virtue.*

New-York: Printed by Samuel Campbell, No. 37, Hanover-Square. M, DCC, XCIII. 40 pages, 8°.

The dissertation was dedicated "to Robert R. Livingston, Chancellor of the State of New-York, President of the Society, instituted in the State of New-York, for the promotion of Agriculture, Arts, Manufactures, etc."

Seaman was perfectly justified in saying that in writing this dissertation he had "acted in the dangerous and toilsome capacity of a pioneer." "No one," he said, "has heretofore attempted to analyse these waters, all that has been done, was merely skimming their surface; just an enquiry into the nature of the air discharged from them . . . I am the first who has ventured to search into their real substance, to ascertain the ingredients of their composition."[16] Tenney's letter was not yet published and Mitchill's short notices did not much more than "skim the surface." John H. Steel gave

[15] The preface is dated 1st Mo. 1st, 1793 which makes it evident that he must have visited the springs in 1792.

[16] P. vii.

full credit to Seaman's pioneering effort when he said: "to him very justly belongs the honor of first developing the true character and qualities of these interesting fountains." [17]

Seaman was well aware that such a first attempt could not be perfect, but armed with a few reagents and scales he bravely undertook the analysis. There could be no doubt as to the nature of the gas; it was "the true *spiritus mineralis* of Hoffman, the *carbonic acid gas* of the French chemists, the *aerial acid* of Bergman, the *fixed air* of Priestly and Black, the *cretacious acid* of Fourcroy, and what is generally known with the miners, by the name of *choak-damp*." [18]

Seaman then made the following experiments on the water:

I. The *rock water* had a little of the *tincture of turnsol* dropped into it, which immediately gave it a *reddish* tinge.
II. The infusion of our common blue larkspur was not changed by it.
III. In *lime-water*, it instantly induced a milky *turbidness*, followed by a *deposition of white powder*.
IV. *Tincture of galls* rendered it *purple*.
V. *Prusian lime-water* produced no change in it.
VI. A solution of pure *vegetable alkali*, produced a *turbidness* in it.
VII. It was also made *turbid* by *aerated vegetable alkali*.
VIII. Caustic *volatile alkali*, forms a cloudiness in it; yielding a *white precipitate*.
IX. *Vitriolic acid*, dropped into the water, caused a great effervescence, and a little *turbidness*.
X. After vitriolic acid had been dropped in the water, it then became *blue* by *Prusian lime-water*.
XI. *Nitrated silver* formed an immediate copious *white curdled precipitate*; this, as also the water itself, soon assumed a *dirty bluish colour*.
XII. *Nitrated mercury* produced a copious *yellowish precipitate*.
XIII. *Acid of sugar*, occasions a *cloudiness*, which soon falls down in a *white precipitate*.
XIV. *Acetated lead*, produced a copious *white*, but not *granulated precipitate*.

Most of these experiments were frequently repeated, and with similar results.

From these experiments Seaman concluded that the waters contain: [19]

[17] *L. c.*, p. 38. [18] Pp. 17-18. [19] Page 24.

Cretacious acid (carbon dioxide)[20]
Aerated iron (iron carbonate)
Lime supersaturated with cretacious acid (calcium oxide supersaturated with carbon dioxide, in other words, calcium bicarbonate)
A muriatic neutral salt (sodium chloride)
A cretacious alkali (calcium carbonate) and a sulphurious impregnation.

Seaman then proceeded to make a quantitative analysis "by the more tedious process of distillation, evaporation and chrystallization," and the result was that a quart of this water must contain:[21]

Cretacious acid, about	40 cubic inches
Mineral alkali	5.2 grs.
Common marine salt	34.6 grs.
Aerated lime	38.0 grs.
Aerated iron	1.7 grs.

When he came to the discussion of the medical virtues of the waters of Saratoga, Seaman had to confess that he had no clinical experience of his own. "It is much to be regretted," he said,[22] "that there does not some person properly qualified reside at these springs; who would keep a register of the complaints of those who apply there for relief; and the effects of the waters upon them: the want of this obliges us to establish their virtues, from the known effects of the ingredients of their composition, which are now ascertained; assisted by the inaccurate accounts of the neighbours."

The water is not a panacea, Seaman warned, but being an alkaline water supersaturated with carbon dioxide and having a stimulating effect on the kidney, it may be used with advantage in the treatment of "stone and gravely complaints." Carbon dioxide being a powerful stimulant particularly in its combination with iron, the waters "may be very serviceable in chronic rheumatisms, dyspepsia, and some other long standing complaints of debility: and also in old phagedenic ulcers and scorbutic complaints." For their purgative and tonic qualities the waters seem "properly formed for the cure of the dysentery."

[20] The brackets contain the corresponding modern terms.
[21] Page 29.
[22] Page 33.

A

DISSERTATION

ON THE

MINERAL WATERS

OF

SARATOGA;

CONTAINING,

THE MEDICAL DESCRIPTION OF THE COUNTRY, AND THE SITUATION OF THE SEVERAL SPRINGS; AN ANALYSIS OF THE WATERS, AS MADE UPON THE SPOT, TOGETHER WITH REMARKS ON THEIR USE IN MEDICINE, AND A CONJECTURE RESPECTING THEIR NATURE AND MODE OF FORMATION:

ALSO,

A METHOD OF MAKING AN ARTIFICIAL MINERAL WATER, RESEMBLING THAT OF SARATOGA, BOTH IN SENSIBLE QUALITIES AND IN MEDICINAL VIRTUES.

By VALENTINE SEAMAN, M. D.

Physician in the City of New York.

"It is the duty of good Physicians, desirous of establishing a salutary art, on a firm foundation, to have confided to them, to submit to chemical analysis, such Waters as have fame for the cure of any Disease."

BERGMAN.

NEW-YORK:
PRINTED BY SAMUEL CAMPBELL,
No. 57, HANOVER-SQUARE.
M,DCC,XCIII.

Fig. 3.

Title-page of the First Edition of Seaman's Dissertation

Seaman was skeptical as to their effect in the treatment of nervous affections and thought that results obtained were rather to be attributed to "the amusing scenes, more simple food and constant exercise, which are unavoidably connected with a long journey."

Good results had been reported occasionally in the treatment of dropsy, paralytic affections and intermittent fevers, but it was generally considered "prejudicial in phthisical complaints."

Proud of his analysis, Seaman at the end of his Dissertation described "A method of making an artificial mineral water, resembling in every respect that of Saratoga."[23] He analyzed his artificial water and obtained the same reactions: "here then is a clear proof of the success of the analysis, for synthesis or the recomposition of a substance, with similar ingredients to what were obtained from it, by all chemists is considered the surest evidence of the truth of an analysis."

Seaman was not aware that he was initiating a scheme that is still operating today. While the Saratoga Springs Authority is bottling the water of the different springs at the source and is shipping it unchanged all over the country, a private company is making artificial mineral waters that have nothing in common with Saratoga water but the name, and is thus creating much confusion in the people's minds.

All in all, Seaman's pioneering effort was a good job. His analysis was all that could be expected at that time. Without being in any way complete it nevertheless included the major components of the water. Aware of his lack of experience, Seaman was restrained in his recommendations. For a young man of twenty-two years of age the Dissertation was a very creditable piece of work.

3. *From the First to the Second Edition of Seaman's Dissertation, 1793-1809.*

Seaman's book drew the attention of many people to the medicinal properties of the Saratoga springs, and while in the beginning patients used to recruit themselves from the neighbourhood, they now travelled long distances in order to benefit by the waters. Saratoga's chief handicap, however, was still the lack of accommodations. Benjamin Risley built two more log cabins, but conditions

[23] Pages 38-40.

remained bad until 1803 when Putnam's Tavern, Saratoga's first hotel, was opened. In the meantime, however, Ballston Springs had developed into a powerful competitor.

Ballston is situated seven miles southwest of Saratoga Springs. The waters are very much the same and the place was more easily accessible from Albany. It was named after an early settler, the Rev. Eliphalet Ball who around 1770 came from Bedford, Westchester County, with a number of members of his congregation and settled in the vicinity of the springs.[24] The commercial potentialities of a watering place were recognized sooner in Ballston than in Saratoga. At the time when Direk Schouten built his log cabin near the High Rock Spring, Benajah Douglass built a similar cabin at the Ballston Springs. And when visitors came he soon built a frame house for their accommodation. Business was good and in 1791 he erected a large building to accommodate visitors. The following year in 1792, a gentleman from New York, Nicholas Low, built "a large and commodious house close to the spring, which has been kept ever since as a boarding house, and has sustained a high reputation."[25]

Thus at a time when Saratoga had nothing to offer but a few log cabins Ballston already had two comfortable boarding houses. A possible explanation is that the Saratoga springs were in the midst of a forest that had to be cleared while the Ballston springs were in a valley on marshy ground.

Putnam's Tavern was opened in 1803, and in 1804 Mr. Low opened the Sans Souci Hotel at Ballston, "that splendid establishment so universally known and admired."[25] Saratoga and Ballston developed in close competition, and after 1793 most medical writers who visited the region discussed the springs of both spas.

One year after the publication of Seaman's dissertation, in 1794, one of America's most distinguished medical men came to the springs, Dr. Benjamin Waterhouse (Fig. 4), professor of the theory and practice of medicine at Harvard, who will always be remembered as the physician who introduced Jenner's vaccination into America. Waterhouse wrote an account of his trip, a *Journal to Saratoga*, which however remained in manuscript form, but the pages dealing with the Springs became available to Jedidiah Morse who published

[24] See Steel, *l. c.*, p. 157 ff. [25] *Ibid.*, p. 159.

Fig. 4.

BENJAMIN WATERHOUSE
1754-1846

them in the later editions of *The American Universal Geography*. Since they give a good picture of the springs in that year and are little known, I would like to reprint them here:[26]

There are several medicinal springs in the county of Saratoga; those which are most frequented (on account of superior accommodations) are called *Ballstown Springs*, from their being found within the limits of a town of that name. They are situated about twelve miles west of Stillwater, and about 14 from that part of the banks of the Hudson, or North River, famous for the victory of Gen. Gates over Gen. Burgoyne. They are 206 miles above the city of New-York, 36 north of Albany, and about 30 south of Lake George.

These medicinal springs are found in the bottom of a valley, or excavation, forming a kind of bason, of about 50 acres in extent. In this hollow grow lofty pines, which are overtopped by others, that cover and ornament the hills, which rise at a greater or less distance above the brim of this bason. A brook runs through this singular valley, and empties itself by the only natural slope in it. The woods are pretty well cleared near the springs. There is a pretty large house for entertainment, with neat bathing-houses and shower-baths for the convenience of invalids. These, together with the greatest part of this valley, belong to a merchant of eminence in New-York (Nicholas Low, Esq.). The largest spring, however, belongs to the publick. Sir William Johnson made this benevolent reservation, when he sold this tract of land to private individuals. In tracing the history of these medicinal springs, I could only learn that an Indian chief discovered them to a sick French officer in the early part of their wars with the English. But whether they were these very springs in this bason, or those at 10 miles distance, properly called the Saratoga Springs, I know not.

The soil for six miles round this place, is poor and sandy, producing little else than pine trees, shrub oaks, fern and mullen. In the neighbouring hills, ores have been accidentally found, especially iron and copper, or rather what the *mineralogists* call *ferruginous* and *capreous pyrites*. These have been accidentally discovered; for in a country like this, covered with wood, there is as yet no temptation to explore the earth beyond its surface for fuel.

The valley of Ballstown and its environs may be made an enchanting spot, equal, nay superior in some respects to any of the watering places in Europe. There is, for example, a smaller bason, so near to the one already mentioned, that were they of equal size their two circles would form the figure 8. This small bason is so regular in its form, as to seem the result of art, rather than nature. It is not improbable, that in this hollow a spring of water similar to that in the large bason may be discovered, and be converted by the hand of taste into an ornamental fountain. A little higher up orchestras for musick may be erected, and even houses for entertainment built on the very brim of this bowl of nature's forming.

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[26] From the 5th edition, 1805, part I, pp. 492-495.

The Kayaderassoras river, which is about ten yards wide, gives several hints to the man of taste, to turn its waters to the use and beauty of the future town, which these medicinal springs will one day raise in this place.

The medicinal waters which have made this spot so famous of late, are remarkably limpid, considering they contain *iron*, a *mineral alkali*, *common salt* and *lime*. They are brisk and sparkling like champaigne. In drinking, they strike the nose and palate like bottled cider, and slightly affect the head of some people, by their inebriating quality. They derive this exhilerating property from what some philosophers call the *spiritus mineralis*, or what Bergman calls the *aerial acid*; Fourcroy, the *cretacious acid*; and Dr. Priestly, *fixed air*; and is that animating *something* which gives activity to yeast, and life to malt liquors. It is used in the neighbourhood of the springs instead of yeast in making bread, and is found to raise it more speedily and effectually than any other ferment in ordinary use.

Its purity gives it a decided preference over the sediment of beer, which is the leaven commonly used by families who make their own bread. Horses drink these waters with avidity.

The effects on flame and on animal life which the philosopher expects to find from the well known properties of fixed air, the ignorant country people consider with different sensations. They see with astonishment that a candle will not burn near the surface of these waters; that fish and frogs are killed in a few minutes, and that geese and ducks cannot swim in these springs but a few minutes before they expire!

These waters are apt to burst bottles when corked in very hot weather, especially during a thunder storm; but with care may be transported in bottles to any distance. These waters boil with a very moderate degree of heat; they are nevertheless, remarkably cold; for when the mercury in Farenheit's thermometer stood at 86 in the open air, and 79 in the brook running near the spring, it stood in one of these mineral springs at 49, and in the other at 51. The first was constantly secluded from the rays of the sun; the last always exposed without a covering.

The most celebrated chalybeate waters in Europe, are 1st. the *Pyrmont*, from a town so called in the circle of Westphalia, just on the confines of Brunswick; 2d. the *Spa*, (or, as we pronounce it, *Spaw*) which is a beautiful village in the bishoprick of Liege in Flanders; and 3d. the *Seltzer*, from a town of that name in the archbishoprick of Triers in Germany. The Pyrmont is the richest of all the chalybeates; the Spa is the next, and these are they which very nearly resemble the waters of Ballstown, in the county of Saratoga, in taste, chymical analysis, and medicinal virtues.

The Pyrmont water, the Spa, and the Seltzer form a considerable article of commerce. The Saratoga waters are equally precious, and may become as valuable in a commercial view in the United States, as the former are in Europe, when they are drank, not merely medicinal, but as a luxury. A few men of opulence and enterprize might give our chalybeates a circulation

through the United States, which would be as lucrative to them as beneficial to the publick.

Physicians seldom direct their patients to drink more than three quarts of these waters in 12 hours, but some who visit those springs drink the enormous quantity of three gallons, and even more in a day. Cold as they are, they may be drunken with safety in the hottest weather, owing to that exhilerating volatile spirit already mentioned. They increase every natural evacuation, and what is a little extraordinary, they are cathartick, diuretick and sudorifick, at the same time. On the first trial they are apt to disagree with many people; they create uneasiness in the stomach and bowels, and cause a heat in the glands of the throat, until they begin to pass off freely by the kidneys. Then they become pleasant and operate agreeably. They blacken the teeth and also the alvine faeces. They are deemed specifick in *anorexia*, or want of appetite; and in *dyspepsia*, or difficulty of digestion. They are highly serviceable in most hypochondriack cases, and are equally serviceable in some difficulties and obstructions, which will be particularly mentioned hereafter. They give relief in the stone and gravel. Their credit is not so well established in the gout nor in the rheumatism. They are manifestly prejudicial to the consumptive, and to the constitutions or habits that are prone to inflammations. Their use occasions heats in the glands of the throat and stiffness of the neck, and, in such as are subject to teeth-ach, an aggravation of the pain.

They are highly and justly celebrated in cutaneous diseases, but here discretion is requisite. They throw out pimples in those who have them not, and increase all eruptions already out. They inflame sores, which renders it necessary to drop their use for a few days, and then begin again; at length they cease to have this effect, the sores dry up, and the eruptions vanish. Exercise in a carriage, or on horse-back, greatly assists their salutary operation. But much cannot and ought not to be expected without temperance, especially in eating.

Thousands drink and bathe in these Saratoga waters (for by that name I include those at Ballstown as well as those in the limits of the town of Saratoga) in the course of a year: the majority declare themselves pleased and benefited by their use; many reap no advantage whatever, and some are destroyed by them. In fine, they are a very powerful and precious remedy in the hands of the judicious, and ought to be enumerated among the very valuable productions of our happy country.

About ten miles from Ballstown valley, and within the limits of the town of Saratoga, there is a cluster of springs, which are more properly called the *Saratoga springs*. They are situated in a shallow vale, or marsh, in several respects resembling that of Ballstown. These waters appear to have received as strong if not stronger impregnation of the same kind of ingredients that enter those of Ballstown, and may be a stream of the same fountain, running through the same kind of calcareous earth. One of these springs is covered over by a natural cretacious, or rather calcareous pyramid, about 5

or 6 feet high. This hollow pyramid, or cone, has a hole in the top about 6 inches over. If we look into this hole, we see the mineral water boiling vehemently like a pot over the fire; the water is nevertheless intensely cold, and is, I think, in every respect smarter than that at Ballstown. The calcareous matter extends for several rods from the basis of this pyramid. There are several idle stories related of this spring, one is that it overflows at certain stages of the moon. This is not true. As this is found to be false, they tell you it overflows once a year; but this I believe has as little foundation in truth as the other. People who live at these springs think they must relate something marvellous by way of enhancing the value of the waters, and reconciling you to the great expense attending these visits.

It was generally assumed that the waters of Saratoga and Ballston were identical. They both bubbled and seemed to have the same qualities. Dr. Waterhouse was correct in his guess that they "may be a stream of the same fountain, running through the same kind of calcarious earth." Seaman had limited his investigation to the water of Saratoga, and so it remained for somebody else to analyze the waters of Ballston. This was done by another physician from New York, Dr. Peter Vandervoort, who in 1795 published the results of his experiments in a pamphlet:

A treatis, on the analisis of Ballston mineral spring water. By Peter Vandervoort, M. D. of New York. Johnstown (State of New York): Printed by Jacob Dockstader, four doors south of the Court-House. M, DCC, XCV.

18 pages, 8vo. (11.5 x 18 cm.)

The pamphlet is extremely rare today, and although I have corresponded with a large number of libraries on the subject I was not able to find a copy of it.[27] The information I have on Vandervoort's work is entirely from secondary sources.

In the second edition of his Dissertation Seaman discusses Vandervoort's analysis[28] according to which the Ballston water was found to contain:

[27] I am greatly indebted to Dr. Walter S. McClellan, Medical Director of Saratoga Spa, for the exact title of the pamphlet. A copy was on the market some time ago and was offered to the New York State Library which, however, did not buy it on account of the exorbitant price of $250.

[28] *A Dissertation on the Mineral Waters of Saratoga*, 2nd ed., New York, 1809, p. 70.

Muriate of Soda,
Carbonate of Lime,
Carbonate of Iron, and
Carbonic acid.

Vandervoort made not only a qualitative but also a quantitative analysis which was reprinted in the *New York Medical and Philosophical Journal and Review*[29] in an article that we shall discuss later. According to the analysis 10 pounds, or 10 pints of Ballston water, equal to 288.75 cubic inches contained:

Carbonic acid gas	270.83 cubic inches
(equal to)	125.93 grains
Muriate of soda	180
Carbonate of lime	166.25
Carbonate of iron	19.37

For the following nine years, from 1795 to 1804, I have so far not been able to find any new medical literature on either the waters of Saratoga or Ballston. There was apparently little demand for it. The waters had been analyzed, and there had not been any new developments in either of the spas.

The situation changed in the beginning of the new century when in 1803 Putnam's Tavern was opened at Saratoga, and in 1804 the Sans Souci Hotel at Ballston. The greatly improved accommodations attracted many more visitors, and there must have been an increased demand from the medical profession and the public for further information about the spas. It may also be that Seaman's Dissertation was out of print by that time and Vandervoort's pamphlet printed in a small-town press in an edition that could not have been large was probably not easily available either.

At any rate a new publication appeared in 1804 (Fig. 5):

A History of the Medicinal Springs at Saratoga and Ballstown: Being a brief account of the situation, composition, operation, and effects, of those celebrated waters;—with a catalogue of all the diseases, in which they are beneficial, or injurious; and directions how to use or apply them in each; attended with remarks on the proper seasons to visit them, the accommodations, customs, expense of board, etc.

[29] 1810, vol. II, p. 159.

A

HISTORY

OF THE

Medicinal Springs

AT SARATOGA *AND* BALLSTOWN:

BEING A BRIEF ACCOUNT OF THE SITUATION, COMPOSITION, OPERATION, AND EFFECTS, OF THOSE CELEBRATED WATERS;—WITH A CATALOGUE OF ALL THE DISEASES, IN WHICH THEY ARE BENEFICIAL, OR INJURIOUS; AND DIRECTIONS HOW TO USE OR APPLY THEM IN EACH; ATTENDED WITH REMARKS ON THE PROPER SEASONS TO VISIT THEM, THE ACCOMMODATIONS, CUSTOMS, EXPENSE OF BOARD,

&c.

Taken from actual Experiment and Obser[illegible]

SURGEON GEN'L'S OFFICE 83851 LIBRARY

BY *TIMOTHY HOWE*, PHILOM.

Published according to Act of Congress.

BRATTLEBORO', VERMONT—PRINTED 1801.

Fig. 5.

Title-page of Timothy Howe's
History of the Medicinal Springs at Saratoga and Ballstown

Courtesy of the Army Medical Library

Taken from actual Experiment and Observation.
By Timothy Howe, Philom.
Brattleboro,' Vermont—Printed 1804.
23 pages, 12°.

It was a strange publication, a libel on Saratoga rather than a serious study. The author was certainly not an M. D. or he would not have failed to put it on the title page. I am not sure that he was a physician at all, because his medical remarks are rather amateurish. He called himself "a lover of learning," Philomath, and there is no doubt that he had a certain general knowledge of science. His preface reveals that he was totally unfamiliar with the existing literature when he said:

> It is thought those who have long deplored the want of a publication upon the nature and operation of the Saratoga and Ballstown Springs, will with avidity embrace this little Pamphlet, and afford it all the candor and indulgence its novelty requires.
>
> The writer is aware of the imperfections indispensable in a first attempt to delineate the real virtues of those waters . . .

Howe had apparently never heard of Seaman or Vandervoort, or then he ignored them deliberately. He must have been at the Springs where he had gathered some information and gossip, but he must have had unpleasant experiences, particularly in Saratoga. No words were hard enough to condemn the place, while he had a much better opinion of Ballston Springs. At times it looks as if he were advertising the Sans Souci Hotel at the expense of Putnam's Tavern.

The climate of Saratoga was described as being very bad, "especially in those seasons of the year when the air is most infected with the effluvia that rise from the neighboring mill ponds. In these seasons the inhabitants universally become pale and sickly; the moral faculty is likewise deeply affected; hence the general indolence and intemperance which characterizes the place." It is needless to say that Howe did not attempt an analysis of the waters. He merely stated that they were "highly impregnated with iron ore, common salt and insipid earth." He could not deny that they had been found to be useful "in many if not most diseases when judiciously exhibited or applied," but he also added that they could "become mischievous in producing obstructions and inducing languor and debility

with all the train of diseases into which they form," a reason why the local inhabitants never used them except for baking bread.

Howe then gave an alphabetical list of the diseases commonly treated at the springs, indicating briefly whether the water should be drunk or used as a cold or hot bath. The diseases listed are: ague or intermittent fever, apoplexy, appetite—loss of, asthma, cholera-morbus, consumption—nervous, colic—bilious, colic—hysteric, consumption of the liver or lungs, convulsions, deafness, diarrhoea, dropsy, eyes inflamed, fluor albus, gout, hypochrondriasis and hysteria, jaundice, madness, palsy, rheumatism, rickets, scald-head, stone and gravel.

As a whole the advice given was not bad and reflected the practices commonly used at the Springs in those days. The pamphlet was written for laymen who took the waters without a physician. The medical profession did not take any notice of it; so far at least I have never found it mentioned in the medical literature.

The last section of the pamphlet consisted of:

A Letter, Written by Doct. H. to his friend Mr. F. S——; giving a particular account of the medicinal springs, at Ballstown and Saratoga, in the state of New-York.

I cannot decide whether the letter was actually written by a Dr. G. H. residing near the Springs or whether it was a fiction. The beginning seems to be a mere abstract from Waterhouse's report. I am reprinting the letter here as a characteristic document and as a testimony of the feud that had developed between the two spas:

Dear Sir,

In obedience to your will, with which it is always my pleasure to comply, I give you this historical description of those far famed waters, near which I reside. They issue from a hill which abounds in iron ore, clay and limestone, with all of which they are highly impregnated, as well as with neutral salts; yet they are very clear, and sparkle in the glass like good champaign, owing to their being highly charged with fixed air, which they discover by changing colors, raising bread, &c. as well as by the sensation they excite in drinking. On this account they prove immediately fatal to fish, frogs, &c. and will extinguish the flame of a candle if held near its surface. But it is needless for me to attempt to enumerate all the appearances or effects of this acid, (for it is really an acid, composed of the principle of common air and charcoal.) The whole ingredients form a composition not in general disagreeable

to people or animals; horses especially drink it with avidity, and it is said to be an infallible remedy in that disorder denominated the *heaves*. They sometimes on a first drinking produce a slight sickness at the stomach, and sometimes they slightly affect the head; but as soon as they begin to pass off by the kidneys, as they do very freely, nothing more is felt of either. The spirit contained in that kind of salts with which these waters are impregnated creates a moderate thirst, and joins the fixed air in facilitating their operation, which is to pass off by the kidneys and the pores of the skin, as well as by stool. Those at Saratoga are rather the most powerful, but those of Ballstown are most pleasantly situated and afford much the best accommodations; many circumstances conspiring to render this situation elegant and agreeable. They are situated near the bank of a small, though beautiful river, and surrounded by several large and commodious buildings. The place appears flourishing in all respects, and no pains are wanting to render the situation pleasant and agreeable to gentlemen and ladies of taste and fortune.* Those of course resort here from all parts of this country, and many from Europe, to spend the summer season. During which period they make frequent tours to Saratoga Springs, and from thence to Lake George, about thirty-two miles from Ballstown and twenty-two from Saratoga; at which place there are now built, and building, several convenient houses for their reception on an eminence of ground at the south end of the lake.—Here they regale themselves, and after taking an airing upon the lake, in pleasure boats, return by the same route. The situation of Ballstown springs is also more favorable to health than that of Saratoga, having less stagnant water and mephitic air; on which account these springs are always to be preferred to those of Saratoga. From a contrast of the inhabitants other motives arise to confirm the justice of this remark. Those of the former place are civil and agreeable, but those of the latter quite the reverse. Little will be found at Saratoga to amuse and divert the delicate and refined part of society; although such as are not offended by drunkenness and profanity, with many other species of vice and vulgarity, may be well accommodated here; there being two large and convenient houses for the reception of valetudinarians, besides others of less note. It would be unjust however to assert that there are no inhabitants at these springs who are decent and respectable; it is enough to say they are too scarce, and probably will remain so while the soil continues in the hands of its present landlord, and the climate in its present unhealthful state. The only difference in the quality of the several springs is, that some are more, and others less impregnated with the general properties of all. The Congress-spring at Saratoga is the most powerful, or rather it contains most neutral salt and least insipid earth. The Flat-Rock-spring contains most fixed air and insipid earth. There is very little difference between the other springs in common use, either at Saratoga or Ballstown. There is likewise little odds in the

* There was a very magnificent building erected here the last summer, which for size or expens: exceeds any thing of the kind in the country.

expense of boarding at either place; genteel board is generally about four or five dollars per week, and common board two dollars per week.** The board is lowest before the weather becomes very hot, as in May and June—The country is likewise most healthful at this time, and the water most beneficial. But after this season is past I would by no means advise a friend to visit, for any length of time, the springs at Saratoga, on account of the sickliness of that season (as July, August and September) after which the climate is less perilous and the board again lower.

But sir, hoping I have satisfied your particular request, and given you the information most necessary for one who determines to visit them, and is possessed of other sources of information as to their nature, operation, &c. I beg leave to subscribe,

Your most obedient, humble servant,

G. H.

January 16, 1804.

In 1807 a New York gentleman, Robert L. Livingston, went to France and had a sample of Ballston water analyzed by "one of the most celebrated chemists" of that country. On September 10, 1807, he wrote from Tours the following letter to Dr. David Hosack (Fig. 6), the eminent New York physician, botanist and mineralogist:[30]

Tours, September 10, 1807.

Dear Sir,

Having received some benefit from the mineral waters of Ballston, of late years frequented by invalids from every part of the continent, I determined to have them analysed, and accordingly had two dozen bottles hermetically sealed, which arrived here in a perfect state of preservation. Presuming that a knowledge of the component parts of those waters may be of public benefit, I have the honor to transmit herewith the analysis of them, by one of the most celebrated chemists; and to request that you will have the goodness to make it public.

On my arrival at Paris, I drank two bottles of the water, and found no difference in the taste or effect, than that experienced last year at Ballston, from which I conclude that the component parts suffer little or no alteration from transportation.

** At different houses board is afforded at any price from 1½ to 5 or 6 dollars per week.

[30] In 1810 Hosack published the full text of the letter in the first volume of his journal the *American Medical and Philosophical Register*, vol. I, 1811, pp. 40-42.

Fig. 6.

DAVID HOSACK
1769-1835

Having this moment heard of a safe opportunity to New-York, I have only time to assure you of my esteem and respect.

Your most obedient servant,
ROBERT L. LIVINGSTON.

L'Analyse de l'eau que M. L. m'a donné à analyser, contenant par bouteille de 25 onces.

SAVOIR.

1. Acide carbonique (air fixe) ..... 3 fois son volume.
2. Muriate de soude (sel marin) ..... 31 grains.
3. Carbonate de chaux sursaturé ..... 22 grains.
4. Muriate de magnesie (sel marin à base de magnesie) .. 12½ grains.
5. Muriate de chaux (sel marin à base de chaux) ..... 5 grains.
6. Carbonate de fer ..... 4 grains.

"Aucune eau minerale de notre continent n'est aussi riche en substances salines de ce genre; celle de Vichy, qui a une grande réputation, ne contient par bouteille qu'un dixième de grain de carbonate de fer tandique celle dont nous donnons l'analyse en contient 4 grains. C'est au fer que ces espèces d'eaux acidulées doivent leur qualités toniques et desobstruantes.

"A la dose de deux bouteilles l'eau d'Amerique doit être un leger purgatif qui convient dans tous les cas, ou il est nécessaire d'évacuer la bile, et donner du ton au système vasculaire; cette eau véritablement précieuse, pour une infinité de maladies, semble avoir été formée par la nature, dans les meilleures proportions, pour guérir les pâles couleurs, et les suppressions. On ne doute point que cette eau ne devienne un objet important de commerce."

Dr. Hosack was much impressed by Mr. Livingston's letter and transmitted its content to Dr. Edward Miller, of New York, who with Samuel L. Mitchill and Elihu H. Smith was editing the *Medical Repository*, in the following letter:

Presuming that an accurate knowledge of the composition of Balltown waters may be of publick benefit, and lead to a more general use of this valuable article of the Materia Medica, I request the favour of you to give place in your Repository to the following analysis, which has been made in France by one of her most celebrated chemists. It may be proper to remark, that the water was carefully sealed at the Spring, and conveyed by a gentleman who had been in the habit of drinking it. He observes, "On my arrival at Paris, I drank two bottles of water, and found no difference in the taste or effect from that experienced last year at Balltown, from which I conclude that it suffers no alteration from transportation." Analysis of a bottle of Balltown water, containing twenty-five ounces: . . . 1. Carbonick acid gas,

or fixed air, three times its bulk. 2. Muriate of soda, or marine salt, thirty-one grains. 3. Carbonate of lime, supersaturated, twenty-two grains. 4. Muriate of magnesia, twelve and a half grains. 5. Muriate of lime, five grains. 6. Carbonate of iron, four grains.—The chemist proceeds to add, "No mineral water of our continent is so rich in saline substances of this sort. That of Vichy, which is in great repute, does not contain more than the *tenth of a grain* of the carbonate of iron to a bottle; while that of Balltown contains *four grains*: And it is chiefly to the iron that these waters owe their tonick and deobstruent qualities. Another advantage of the American mineral water is, that by its gentle cathartick operation, it is no less calculated to evacuate bile, than to give tone to the vascular system. On these accounts it is a valuable remedy in a great variety of diseases of debility, and appears to be formed by nature in the best possible proportions to give it efficacy." He adds, "I have no doubt, when known, it must become an important object of commerce."

Two inferences worthy of notice are to be deduced from the above analysis of this powerful chalybeate; that in some diseases, as in consumption of the lungs, it has hitherto been improperly employed; but that there are also many others, for which it has not been generally used, and in which it promises to be of great value.

Dr. Miller published the letter in the *Medical Repository*[31] and it was published again in *The Monthly Anthology and Boston Review*,[32] so that wide publicity was given to the French analysis.

Since it differed in many ways from the previous analyses, Seaman felt that he had to defend his and Vandervoort's investigations. He wrote for the *Medical Repository*:

An Examination of the Account of an Analysis of the Balltown Waters as published in the last Number of the Medical Repository (Hexade II, vol. V, p. 214). By V. Seaman, M. D.[33]

"Justice to Dr. Vandervoort and duty to the community," he wrote, "require that we give it [the French analysis] some attention, and that the waters should be more particularly examined; not merely to settle the difference between the two experimenters, but for the more important purpose of ascertaining what, in truth are their real contents; especially as they now have got into such general use, and are so frequently prescribed by physicians."

[31] Second Hexade, vol. V, 1808, pp. 214-215.
[32] Vol. V, 1808, pp. 58-59.
[33] *Medical Repository*, Second Hexade, vol. V, 1808, pp. 253-256.

Seaman procured water from Ballston and analyzed it. He strongly denied the possibility of its containing several times its volume of gas. He also denied the presence of muriate of lime but had to admit the presence of magnesia, not as muriate but as carbonate. He ended up by saying:

> Finally, I think we may safely conclude that the Mineral Waters of Ballston hold in solution
>
> Carbonic acid,
> Muriate of Soda,
> Carbonate of Soda,
> Carbonate of Iron, and
> Carbonate of Magnesia.
>
> Nor will any experiments yet published, warrant us in concluding that they contain any thing else.

And now Seaman decided that it was time to prepare a new edition of his Dissertation.

4. *The Second Edition of Seaman's Dissertation and the Ensuing Controversy.*

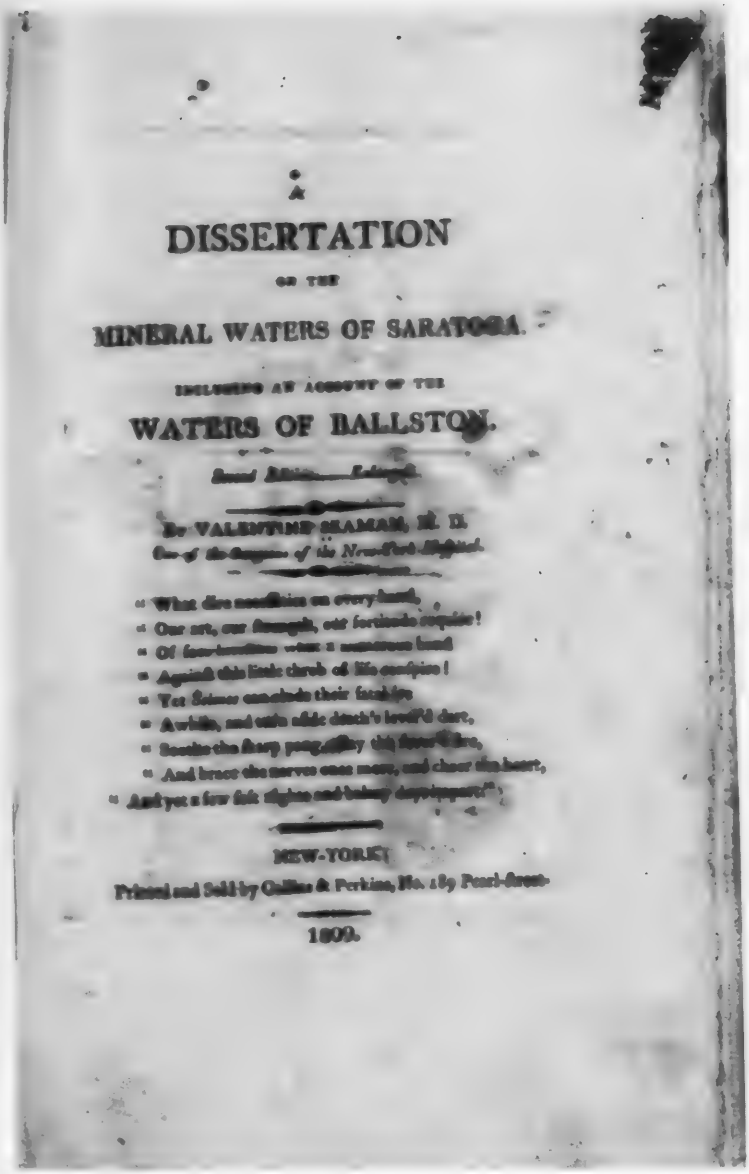
Since 1793 Seaman had made a good career. He had been appointed one of the surgeons of the New York Hospital, and he had been one of the early advocates of Jenner's vaccination. In 1796 he published *An Account of the Epidemic Yellow Fever as it appeared in New York in 1795* and in 1800 *The Midwives Monitor and Mothers Mirror*, besides contributing to medical journals.

The new edition of the *Dissertation* was issued in 1809 (Fig. 7):

A Dissertation on the Mineral Waters of Saratoga, Including an Account of the Waters of Ballston. Second Edition . . . Enlarged. By Valentine Seaman, M. D. One of the Surgeons of the New-York Hospital.

New-York: Printed and Sold by Collins & Perkins, No. 189 Pearl-Street. 1809. 131 pages.

The book had as frontispiece a folding picture showing the geographic location of the Springs taken from De Witt's Map of the State, and "A View and Section of the Rock Spring at Saratoga" (Fig. 8). The new edition was dedicated to Dr. John Coakley



A

DISSERTATION

ON THE

MINERAL WATERS OF SARATOGA.

INCLUDING AN ACCOUNT OF THE

WATERS OF BALLSTON.

Second Edition, Enlarged.

By VALENTINE SEAMAN, M. D.

One of the Surgeons of the New-York Hospital.

"What dire convulsion on every hand,
"Our art, our strength, our fortunate empire!
"Of fourscore years a numerous band
"Against this little shrub of life conspire!
"Yet Science can abate their fatal ire
"A while, and calm oblic death's level'd dart,
"Soothe the sharp pang, allay the fever's fire,
"And brace the nerves once more, and cheer the heart,
"And yet a few fair nights and balmy days impart."

NEW-YORK:

Printed and Sold by Collins & Perkins, No. 1 by Pearl-Street.

1809.

Fig. 7.

Title-page of the Second Edition of Seaman's Dissertation

Lettsom and began with a rather exalted introduction in which the author, among other things said: "What a glorious era will the present time exhibit in the history of medicine; for beside the many other late improvements in the practice of physick, the single establishment of Vaccination alone, has afforded more unblemished comfort to suffering humanity, than any other discovery ever made by the profession."—"As the burning mountains of Italy command the astonishment of mankind, so the cold boiling Springs of Saratoga ought, I had almost said, to demand their adoration. . . ."

The weak point of the new edition was that Seaman had apparently not revisited the Springs. The whole section on Saratoga was practically the same as in the first edition. It had twice as many pages, but the pages were smaller and the type larger. The analysis was unchanged; in other words, he had not made any new investigations. The only changes were in the chemical nomenclature: cretacious acid had become carbonic acid, aerated iron, carbonate of iron, etc.

The quantitative analysis looked different at first sight:

First edition		*Second edition*	
Cretacious acid, about	40 cubic inches	Carbonic acid, about	200 cubic inches
Mineral alkali	5.2 grs.	Carbonate of Soda	26 grs.
Common marine salt	34.6	Muriate of Soda (sea salt)	173
Aerated lime	38.0	Super carbonated Lime	190
Aerated iron	1.7	Carbonate of iron	8.5

Actually the analysis was the same. The nomenclature had changed, and in the first edition the weights were given for one quart of water while in the second they applied to 10 pounds of water. If we multiply the first figures by 5 we obtain the second set of figures.

An innovation was that in the qualitative analysis Seaman admitted the presence of a salt of magnesia, a fact that he had learned from the French chemist.

Also new was the section on Ballston, that is, it was new only in so far as the Dissertation was concerned because it consisted mainly of a reprint of the article that Seaman had published the previous year in the *Medical Repository*, in which he had discussed the findings of Dr. Vandervoort and of the French chemist.

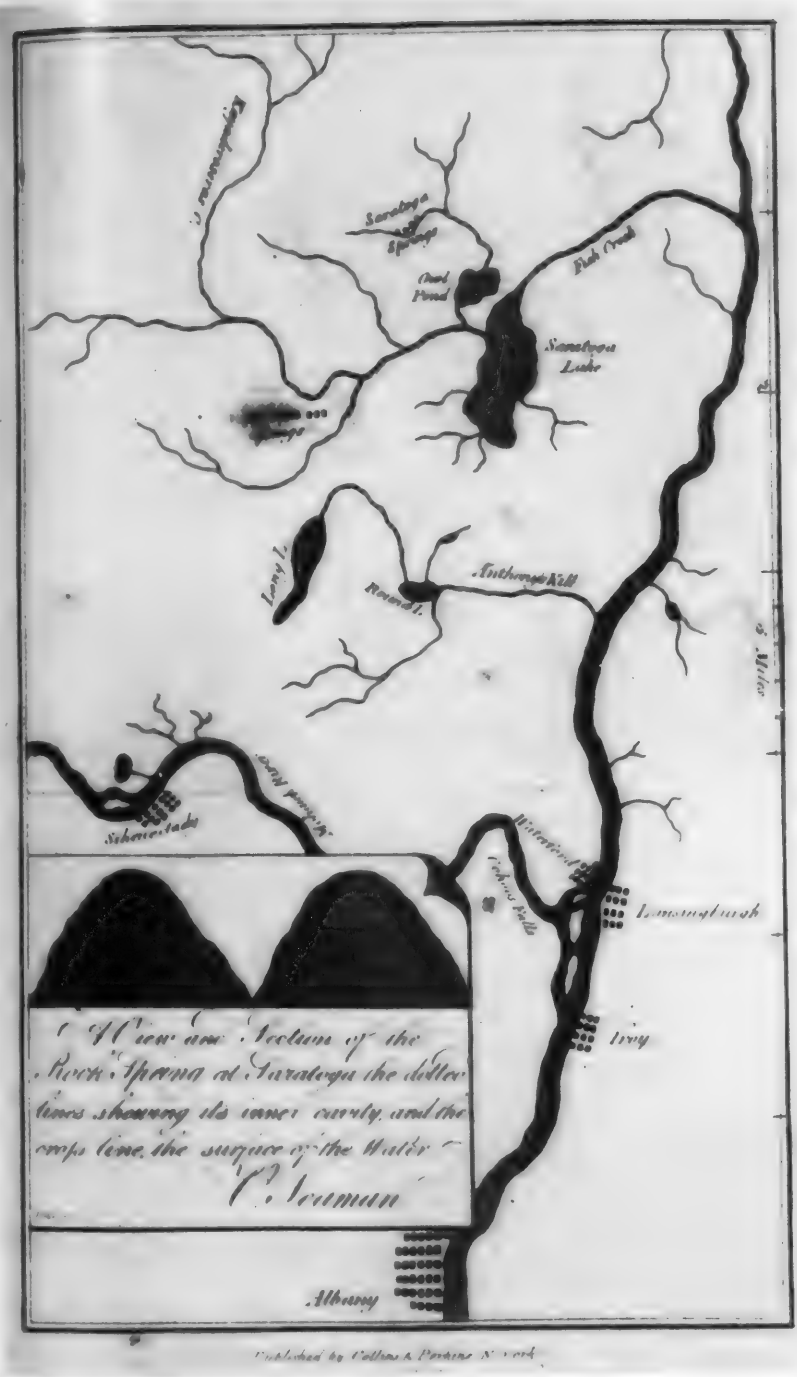


Fig. 8.

Frontispiece to the Second Edition of Seaman's Dissertation

The clinical part of the book was decidedly longer than in the first edition without saying much more. Seaman still had no experience of his own in spa treatment, but he had gathered information from Dr. Powell, an able physician who had been practising at Ballston Springs for several years, and from whom he heard of the good results obtained in the treatment of phagedenic ulcers and scrofula.

The book was also longer because the Springs were no more the primitive place they had been in 1793. Saratoga could boast not only of Putnam's Tavern, but also of the Columbian Hotel that Gotham Holmes had built near the Flat Rock, and Ballston's Sans Souci Hotel was justly famous. Seaman, therefore, could not resist the temptation to sing the praise of the spas and the following passage may at the same time serve as a sample of the style that he had acquired:

> The face of the surrounding country, diversified with Lakes and intersected with the branches of the Kayadarosoras, the vicinity of the majestic Hudson, with its fine hanging bridge, on the east; the rich Mohawk, and the roaring cataract of the Cohoos, on the south; together with the romantic mountain scenery on the north and west, all conspire to make this one of the most interesting spots that the imagination could conceive. The sportsman here, need never languish for want of employment: should fishing be his favourite amusement, he has the lakes and rivers at his command: if he delights in his gun, here are not wanting objects whereupon to try his skill. To those who are fond of riding and of enjoying the sublime and varied scenery of nature, no country is better calculated than this to gratify their taste. When to all this, we add the extraordinary accommodations and entertainment furnished at Ballston, equalling the most unbounded wish, we cannot be surprised that these, like most other celebrated Medicated Springs, from having at first been the refuge of suffering humanity, the comfortable asylum of the afflicted invalid, should become the seat and empire of luxury and dissipation, the rallying point of parties of pleasure. Where one person *now* applies there to repair a disordered constitution, twenty go, in the gaity of health, to sport a sound one, against the enervating influence of revelry and riot. It is hoped, however, that like the fashionable resort at Spa, the distant situation of the different Springs from each other, will assist in preventing those votaries of pleasure from sinking into that state of indolence and inactivity, so apt to prevail at such places of public rendezvous.
>
> The favourable circumstance of the relative situation of the several objects of attention in this neighbourhood, taken all together, is certainly matter for congratulation to that class of visitors whose chief view is to pass their time agreeably; for besides the sources of amusement just mentioned, other con-

siderations will, in addition, impose a kind of necessity on many of keeping themselves actively engaged. For while the superior accommodation fixes upon Ballston as the place of dwelling, the Springs of Saratoga will command frequent visits. For who, making the least pretensions to the character of a *virtuoso*, would stoop to drink of the waters of Ballston, when a few miles ride would treat him freely with plenteous draughts from the fine stone *vase*, that superb piece of nature's unassisted workmanship. The more powerfully purgative quality of the water of the *Congress Spring*, will secure it a repeated call from those who require its evacuative operations. And as to the *Lakes*, which are interspersed in different directions a few miles distant from the Springs, no professional man can entertain a doubt that the more detergent properties of their *soft* waters, will richly reward those for their trouble, who may visit them for the purpose of Bathing.

Duly to atttend to all the above enumerated objects, and to improve them to the best advantage, will require repeated and varied excursions, all which will occupy time, and they will occupy it to good purpose; for hereby, while indulging in a pleasurable exercise, we are gaining, as far as respects our constitutions, all the advantages of labour, and that beguiled of its toils.

"From labour health, from health contentment springs;
Contentment opes the source of every joy."

This mode of passing the time, it is true, may chill the mace and paralize the balls of the billiard board, but it will warm the heart, and promote the healthy movement of its blood: it may diminish the demand for cards, but it will enhance the value of life.

"*. . . ut sit mens sana in corpore sano.*"

"A healthy body and a mind at ease."

Let us then be upon the alert, and by well directed exertions repel the approaches of disease, and keep clear from the favours of the Faculty: it is assuredly

"Better to hunt the fields for health unbought
Than fee the Doctor for a nauseous draught."

Seaman's first edition had been a pioneering venture, but the new edition was disappointing. Although presented much more pretentiously, it added little to the subject and supplemented lack of knowledge with rhetoric.

The reception of the book was bad. A review appeared in the *New-York Medical and Philosophical Journal and Review*[34] that tore the book to pieces. It poked fun at the style, derided the frontispiece picture on which Seaman seemed to have depicted Mount

[34] New York, 1809, vol. I, pp. 286-290.

Vesuvius rather than the cone of the High Rock Spring, and criticized the analysis of the water rather severely. The review was offending because it was ironical and at the same time patronizing. Seaman was infuriated and wrote for the *Medical Repository*[35] a vitriolic answer:

An Examination of "A Review of a Dissertation on the Mineral Waters of Saratoga, etc. by Valentine Seaman, M. D. etc. as published in the second number of the New-York Medical and Philosophical Journal and Review. T. and J. Swords. 1809." By the Author of said Dissertation.

In equally ironical vain he endeavored to refute the criticisms proferred, calling upon the authority of all great chemists of the day. But he did more: he added a personal letter:

To Benjamin De Witt, M. D. and Dr. J. A. Smith, Editors of the New York Medical and Philosophical Journal and Review

in which he stated that he was convinced that neither of the two editors could have written such a review and in which he unloaded his anger in the following paragraph:

> As to the *humour* displayed in the article alluded to, I have but little to say: If it has relieved the writer, *I* ought not to complain. If, by standing in the way of one affected with *atra bilis*, I should by chance receive a sprinkling of the morbid matters ejected from his disordered stomach, could I take offence? Would not any one, thus circumstanced, lose all thoughts of so slight an injury, in pity for the deplorable state of the poor sufferer under so dreadful a disease?

And now the editors of the *New York Medical and Philosophical Journal and Review* were offended. They reprinted Seaman's *Examination* in their journal,[36] omitting the end however, as being "frivolous and unworthy of notice." They added an editorial note in which they censored Seaman for having sent his answer to another journal and justified their editorial policy in regard to book-reviews.

But this was not all: the reviewer himself stepped forward and addressed the following letter to Seaman:[37]

[35] New York, 1809-1810, vol. XIII, pp. 210-216.
[36] New York, 1810, vol. II, pp. 139-144.
[37] *Ibid.*, pp. 143-144

To VALENTINE SEAMAN, M. D.

SIR,

You have published, in the Medical Repository, a two-fold reply to a review of your dissertation on the Saratoga and Ballstown waters in the Medical and Philosophical Journal. That part of this reply which is first in order, is decent and proper. It is such as you had a right to make, and if you had confined yourself to the manner and matter there adopted, you would have been entitled to a respectful answer. But the second part is rude, and reprehensible. It is pointed at individuals whom you were not authorized to address, and it is altogether irrelevant to the occasion. Having taken this improper course, your observations should have passed unnoticed by me, but for the three following considerations.

1st. You have misrepresented a material part of the review in question. On this point *justice to myself* requires me to give it such a minute and perfect explanation as to bring it, if possible, within the sphere of your comprehension.

2d. You have uttered mysterious insinuations, implicating the motives of the Reviewer, not from any thing "*manifested*" on the face of the review, "*but upon very different grounds.*" For this violation of decorum, *justice to you* demands that you should receive appropriate correction.

3d. You have persisted in repeating again and again the most flattering commendations on your *own* experiments, your *own* reasoning, and your *own* analysis, as patterns of correctness and truth, superior to those of other chemists, whom you at least ought not to consider beneath yourself. And this you have done without, at the same time, giving sufficient evidence, by your work itself, of its accuracy or its excellence. For this your *modest assurance, justice to the public* renders it necessary that your pamphlet should be more minutely examined than it has hitherto been, to expose its errors to every eye.

My business then is to administer distributive justice to the *public*, to *you*, and to *myself*. In order to do this, however, with sufficient force and effect, I find I must descend from the dignity of a Reviewer, and become your correspondent. I must lay aside for a moment my office of "*public censor*," and assume that of your antagonist. There are wrongs, you know, against which the *civil* code has provided no remedy. In that case the execution of natural law devolves on individuals: and there are transgressions in the republic of letters, not within the jurisdiction of a Reviewer's court. This is precisely your case. The chaste and delicate rules which govern there cannot reach it. For you there is no adequate retribution from that exalted judgment seat. The justice there denied, you shall receive at the hands of

THE REVIEWER.

And Seaman did receive it. The anonymous reviewer who must have been a very competent chemist wrote a regular dissertation of 30 pages as an

Answer to Dr. Seaman's "Examination" of a Review of his Dissertation on the Saratoga and Ballstown Waters, in the second number of this Journal, by the Writer of the Review.[38]

It was a sober factual discussion that unveiled the weakness of Seaman's analysis and the inadequacy of his second edition, and proved at the same time how much more competent the French chemist had been, particularly in determining the amount of carbon dioxide. The reviewer could not resist the temptation to end in the ironical vein also:

> I shall now take my leave of Dr. Seaman, with recommending to his attention the following fable, which he probably has read, but may have forgotten. A crow, conceiting himself endowed with the powers of an eagle, resolved to imitate the exploits of that noble bird. Accordingly, he one day made a pounce at a lamb, but being too weak to bear away his prey, and his feet being entangled in the wool, so that he could not extricate himself, he was caught by the shepherd, who carried him home to his children. They eagerly demanded what bird it was? A short time ago, replied the shepherd, he thought himself an EAGLE, but probably he is by this time convinced he is a mere CROW.
>
> Now, gentle reader, I owe you thanks for your patience in following me through this tedious investigation. Although the "dissertation" I have examined may be worthless, so far as it relates to the analysis of the water; yet the subject itself is interesting and worthy of consideration. There is some hope that the present examination may induce some chemist of competent abilities to give us a complete and satisfactory analysis of these celebrated waters; and should this desirable consequence follow, I shall claim some share of merit for having turned the public attention to this important subject.

Seaman was beaten, but he did not give up immediately. Once more he took the pen and wrote:

A Partial View of the operations of the Combined Powers, as drawn up in the Appendix to the last number of the Medical and Philosophical Journal and Review. By the Author of the Dissertation on the Mineral Waters of Saratoga, &c. the marked object of their terrible attack.[38a]

Seaman obviously was unable to refute the solid arguments brought

[38] *Ibid.*, pp. 145-175.

[38a] *Medical Repository*, New York, 1809-10, vol. XIII, app., pp. 1-8. The copy at the Army Medical Library contains the appendix, while it is missing in two other copies that I examined.

forth by his Reviewer. His defense was weak, and thus the controversy ended. But now that the French analysis had been vindicated, Dr. Hosack published the original text of it in his *Medical and Philosophical Register*[39] and added the following letter:[40]

OBSERVATIONS *on the use of the* BALLSTON MINERAL WATERS, *in various diseases; addressed to Mr.* JOHN COOK, *of Albany, by* DAVID HOSACK, *M. D. Professor of Botany and Materia Medica, in Columbia College.*

New-York, June 20th, 1810

Sir,

To notice all the diseases in which the Ballston waters may be exhibited with advantage, and those in which they do harm, together with the circumstances which should be attended to during the use of them, would far exceed the limits of such a communication as you expect from me, in compliance with your request. Nor do I possess those details which are necessary in taking a full view of the subject; they can only be attained by a long residence at the springs, and a watchful attention to the operation of the waters in the various diseases in which they are prescribed. These particulars will probably be communicated to the public by Doctor Powel, a physician of learning and talents, who has resided several years at Ballston; and who is possessed of much valuable information on this subject. I shall, therefore, confine myself to a few remarks which are more immediately suggested by the preceding analysis.

The Ballston waters have been long known to yield a great quantity of *fixed air*, and to hold in solution a large portion of *iron*. By the analysis referred to, it appears that they yield a much larger proportion of fixed air, and that they contain a greater quantity of iron, than any other mineral water that has hitherto been discovered, not excepting that of Vichy, one of the strongest chalybeate waters in Europe. But it appears that they also contain another substance, viz. the *muriate of lime*, which, with the other ingredients with which it is associated, promises to be of great and extensive utility.

We are accordingly from this analysis induced to ascribe more virtues to the Ballston waters than physicians have generally believed them to possess. Although much is due to exercise, change of air, and an agreeable occupation of the mind, which the amusements of watering places usually afford, I have no doubt, from the sensible effects produced upon the system by the waters themselves, that they also are productive of great good in a variety of diseases, some of which I shall now briefly enumerate.

1. From the effects of the Ballston waters, as a strong *chalybeate*, they

[39] 1811, vol. I, pp. 40-42.
[40] *Ibid.*, pp. 42-47.

may be employed with advantage in most diseases of debility, whether directly or indirectly such. But in those complaints which are attended with an increased excitement of the whole system, or with local inflammation, they are manifestly prejudicial. These principles are deducible from the qualities of the waters alone; but they are also confirmed by the experience and observation of physicians who have attended to their operation.

Accordingly, in *intermittent* fever, *dropsy, dyspepsia*; in *hypocondriasis* and *hysteria*, connected with or proceeding from debility of the digestive organs; in *paralysis, chronic rheumatism, gout* in its chronic state, *chlorosis, fluor albus*; in *suppression of the menses* when arising from weakness, in *worms*, and in other diseases of debility, whether of the intestinal canal, or of the whole system, the Ballston waters have been long and justly celebrated. On the other hand, in a plethoric state of the system, as in *pregnancy*, in *consumption of the lungs, inflammation of the liver, acute rheumatism, dysentery*, and other diseases of an *inflammatory* nature, in which they are often times resorted to, they invariably do injury. We may, perhaps, except from this remark, a *species of consumption* which arises in females about the time of puberty, in which, from want of energy in the system, menstruation does not take place at the period in which it usually appears; dyspepsia ensues, followed with general irritation of the nervous system, pain in the breast, cough, sometimes haemorrhage from the lungs, and ultimately terminating in confirmed consumption. These consequences have frequently been prevented by a course of iron, and vegetable tonics, aided by generous diet, and exercise, especially riding on horseback. Under similar circumstances, I have no doubt that the Ballston waters may be serviceable in this species of phthisis in its incipient state; but they should never be employed in diseases of this nature, without the advice of a physician.

2. From the *saline impregnation* of these waters, and their operation upon the urinary organs, as well as by perspiration, they are indicated in diseases of the *kidneys* and *bladder*, in *gout, chronic rheumatism*, and *eruptions* upon the skin, all which diseases are most frequently produced by, or connected with a morbid condition of the fluids, and an impaired state of the secretions.* In these complaints I have repeatedly prescribed these waters with the best effects.

But according to the foregoing analysis, they contain an ingredient of great value, besides those already enumerated; I mean the *muriate of lime*. It appears upon the authority of Dr. Beddoes,† Dr. R. Pearson,‡ Dr. Wood,§ and Dr. Schraud of Vienna,¶ that this substance has lately been discovered to be a remedy for *scrophula*, which hitherto has been the opprobrium of our profession. It is true, cases have been recorded by Russell and others, of

* See Wilson on Dyspepsia, Gravel, &c. See also Treatise on Gravel and Gout.
† Treatise on the Consumption, Digitalis, and Scrophula.
‡ London Medical Review, vol. 3.
§ Edinburgh Medical Journal, vol. 1.
¶ Treatise de Febribus.

the cure of this disorder by the use of sea water. But as it has been ascertained by chemists,** that the muriate of lime enters into the composition of sea water, it is very possible that much of the efficacy of the latter in that disease, may be derived from the muriate of lime, which it has been found to contain. But as scrophula is usually attended with a general debility of the system, as well as a morbid condition of the fluids, the Ballston waters will probably be found peculiarly serviceable, inasmuch as they possess the means of invigorating the system, at the same time that they contain the antidote to the peculiar virus of that disease.

But to obtain the benefits of the Ballston waters in any of the diseases which have been noticed, it is necessary that in the use of them, as it regards the time of taking them, the quantity taken, the stage of the disease, and other circumstances which must govern their exhibition, the directions of the physician are indispensably necessary. As well might the patient make use of any other article of the materia medica without medical advice, as drink these waters in the manner in which they are usually taken. It is but a short time since, a very valuable life was destroyed by the imprudent use of them, during a state of pregnancy. A few days ago I was consulted by two gentlemen who had left the springs much worse than they had gone to them. The one laboured under dyspepsia, attended with habitual costiveness: neglecting to relieve his bowels, he commenced the use of the waters; the consequences were, an aggravation of his disease, followed with fever, acute pain in the head, and other symptoms of general excitement. The other person referred to, had come from Virginia, on account of an obstinate chronic diarrhoea, attended with great debility, and general emaciation. Without advice, he immediately began to drink the waters to the quantity of several quarts daily. The consequences may readily be imagined; an increase of his disease, and a degree of debility from which he with difficulty recovered.

If, sir, these remarks should contain any thing deserving attention, they are at your disposal. At the same time permit me to refer you, for further information on this subject, to the Medical Repository, the Medical and Philosophical Journal, and to the Dissertation lately published by Dr. Valentine Seaman.

I am, sir, your humble servant,

DAVID HOSACK.

Mr. John Cook

A comparison of the early analyses with the modern one is given in the table, p. 584.

Valentine Seaman died in July 1817 from consumption and in the summer of 1817 a Saratoga practitioner, Dr. John H. Steel, published some observations on the mineral waters of Saratoga and Ballston. This was the beginning of a new chapter in the medical history of the Springs.

** See Lavoisier, Jacquin, Thompson, and Murray.

A COMPARISON OF THE EARLY AND MODERN ANALYSES OF THE SARATOGA WATERS

Early Analyses [41]				Modern Analysis [42]	
Old nomenclature in 10 pounds or 10 pints of water, equal to 288.75 cubic inches	Saratoga water Seaman 1793-1809	Ballston water Vandervoort 1795	Ballston water French chemist 1807	Saratoga Geyser water 1939	*Modern nomenclature* Results in parts per million
Carbonic acid gas	200 cubic in.	270.83	866.25 cub. in.	2-4 times vol. of water	Carbon dioxide
(equal to)	93 grains	125.93	402.8 grains		
Muriate of soda	173	180	198.4	2,511.61	Sodium chloride
Carbonate of lime	190	166.25	140.8	1,877.09	Calcium bicarbonate
Carbonate of iron	8.5	19.37	25.6	23.15	Ferrous bicarbonate
Muriate of lime			32		
Muriate of magnesia			80		
Carbonate of soda	26			2,200.54	Sodium bicarbonate
Carbonate of magnesia	a little			874.71	Magnesium bicarbonate
Sulphureous impregnation	ditto			trace	Sodium sulphate
				61.17	Ammonium chloride
				27.00	Lithium chloride
				233.81	Potassium chloride
				32.00	Potassium bromide
				1.60	Potassium iodide
				trace	Sodium metaborate
				trace	Sodium nitrate
				trace	Sodium nitrite
				trace	Barium bicarbonate
				trace	Strontium bicarbonate
				1.59	Alumina
				6.60	Silica
				7,856.87	Total solids

[41] From *New York Medical and Philosophical Journal and Review*, 1810, vol. II, p. 159.

[42] From Walter S. McClellan, Indications for the internal use of the naturally carbonated mineral waters of Saratoga Spa, *Publications of Saratoga Spa*, No. 9, 1939.

DOCTORS AT THE WHITE SULPHUR SPRINGS

GUY HINSDALE

At White Sulphur Springs before the days of Paradise Row, Louisiana Row, Alabama, Georgia, Virginia and Baltimore Row there was a summer colony for whom accommodations were provided of a crude type and, of course, without any organized medical service. Physicians spent the summer at White Sulphur as did other guests.

Dr. James Calwell was the proprietor one hundred years ago, having obtained his degree in 1842 from Washington and Jefferson College in Washington, Pennsylvania.

Major Baylis' rôle as manager dated from 1834 and he was a very picturesque character as described by Mr. Perceval Reniers in his book the "Springs of Virginia." It was the romantic, glamorous period, a lull before the storm which twenty years later rent the country and divided the state of Virginia into two sections separated by the Alleghany mountains and, what was worse, by political and social barriers. During the war the hotel was not open and of this period we have little information.

The most notable of the physicians to White Sulphur Springs and the one of longest service was Dr. John Jennings Moorman who served from 1838 to 1883. He was very active as a physician and made every effort to acquaint the medical profession and the public with the nature, distribution and great value of our mineral springs and especially those in Virginia and that, of course, included what has been known for the last eighty years as West Virginia.

The first impression one gets from reading his books on the Virginia springs is the very great number of them. No one in that day could foresee the time when such notable springs as the *Old Sweet*, the *Sweet Chalybeate*, or the *Red Sulphur*, the *Bath Alum*, the *Rockbridge Alum*, the *Warm Springs*, the *Healing Springs* and the *Salt Sulphur* should pass out of the picture. In most of these cases the waters are still flowing but their surroundings might inspire another Gray to write an elegy of their oblivion.

The Red Sulphur springs of Monroe County, sometimes called Old Sweet, is in its last phase. Designed by Thomas Jefferson it had a large central building with four rows of cottages. There was a continuous piazza from Carolina House to Philadelphia row 471 feet long. There was and still is a swimming pool. This establishment was converted into a state tuberculosis sanatorium departing widely from the rôle played by a fashionable company who came to take the waters and bathe in them. Incidentally, the patients at the Old Sweet were not allowed to bathe in the poole which was once so prized. It is now disused.

There was formerly great rivalry, and heated discussions as to the relative merits of different springs were common; the nearer these were to each other the hotter the arguments, and the controversy between Dr. Moorman, of White Sulphur, and Dr. Burke, of Red Sulphur, was a notable one. It was conducted during many years strictly on scientific grounds through the press, and eventually took shape in book form.[1] Dr. Goode who owned the Hot Springs lent color to the contest and the various hotel keepers, notably Mr. Fry, of Warm Springs, played no mean part. The old hotel at White Sulphur which had been the center of all social activity during the Calwell regime eventually, as all things must, began to show signs of decay and one night at a ball in 1855 the great floor crashed and consternation reigned.

Mr. Reniers records that in May 1857 the ten Calwell and Bowyer heirs sold the entire property for $600,000 to a group of notables which included Commander Matthew Fontaine Maury, R. H. Maury, Warren Slaughter, Allen T. Caperton, Alex. K. Phillips, A. T. Clifford and James Hunter. The actual heirs received very little. By 1858 a bigger and better hotel was built. The Old White passed through the exciting and uncertain days of civil war, the depression and impoverishment which followed, until 1922 when it was taken down. It was in obedience to a sentimental impulse that the management of the Greenbrier decided to erect a memorial to

[1] Burke, William: Virginia Mineral Springs, with Remarks on their Use, the Diseases to which they are Applied and in which they are Contraindicated. Richmond, 2nd Ed. 1853, 376 pp.—Moorman, J. J., Mineral Waters of the United States and Canada, Balto., 1867, 507 pp. See Memoir by the author, *Annals of Med. Hist.*, Vol. VI, No. 4, 1934.

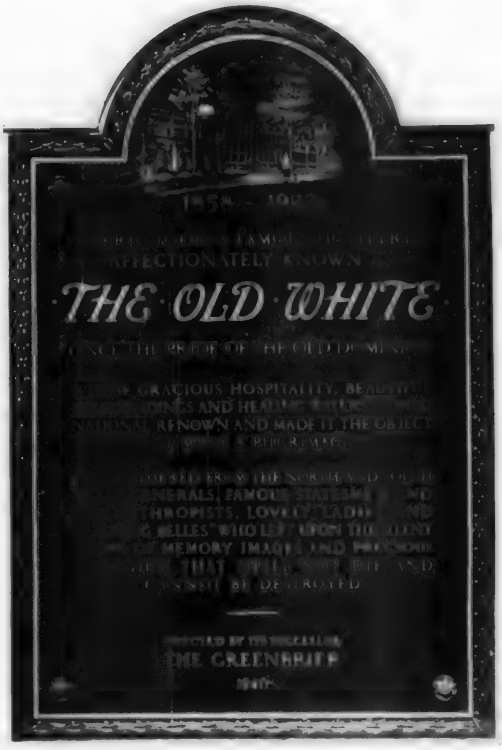


Fig. 1.

the Old White and in August, 1940, a bronze placque was placed at the end of the north lawn. The beautiful design was made by the consulting engineer, Mr. R. H. Patterson, and the inscription was furnished by the writer. Mr. Henry W. Taft unveiled the tablet and the Governor of West Virginia, Hon. Homer A. Holt, made the address (Fig. 1). The idea originated with Mr. L. R. Johnston, Gen. Mgr.

Dr. Moorman (Fig. 2) was a real son of the Revolution as his father, Charles Moorman, was wounded in the battle of Guildford Court House, N. C., in March, 1781. He died in 1803 leaving ten children, John J. being next to the youngest. After working in a drug store in Bedford he studied in the medical school of the University of Pennsylvania. He was not only a well known writer but a professor of Hygiene in Roanoke College (1872-'79) and also professor of medical jurisprudence and hygiene at Washington University School of Medicine in Baltimore. President Andrew Jackson appointed him in 1832 one of the Board of Visitors to the United States Military Academy at West Point. He was a member of the Virginia House of Delegates for two terms, representing Rockingham County.

After the Civil War was over and signs of revival appeared Dr. Moorman revealed another side of his character. In 1871, two years before the great panic of 1873, he organized the Farmers' Bank of Salem and was its first president. This bank, which still exists, has never failed to pay its regular dividend which is more than can be said of many banks in other parts of the country. The strength of a bank is not always in the amount of cash it has, but in the common sense and honesty of its officers and directors.

Dr. T. B. Fuqua, of Roanoke, assisted Dr. Moorman during the later years of his practice at White Sulphur. Another contemporary of Dr. Moorman was Dr. Robert Pinckney Lake. He was the son of George Lake, of Dorchester County, Maryland, where he was born in 1827. The family was of English descent and among the early settlers of Maryland. Dr. Lake received his education at Jefferson College, Washington County, Pa., and from the University of Maryland from which he was graduated in 1850. He settled in Lewisburg and later practiced in White Sulphur. On December 5,

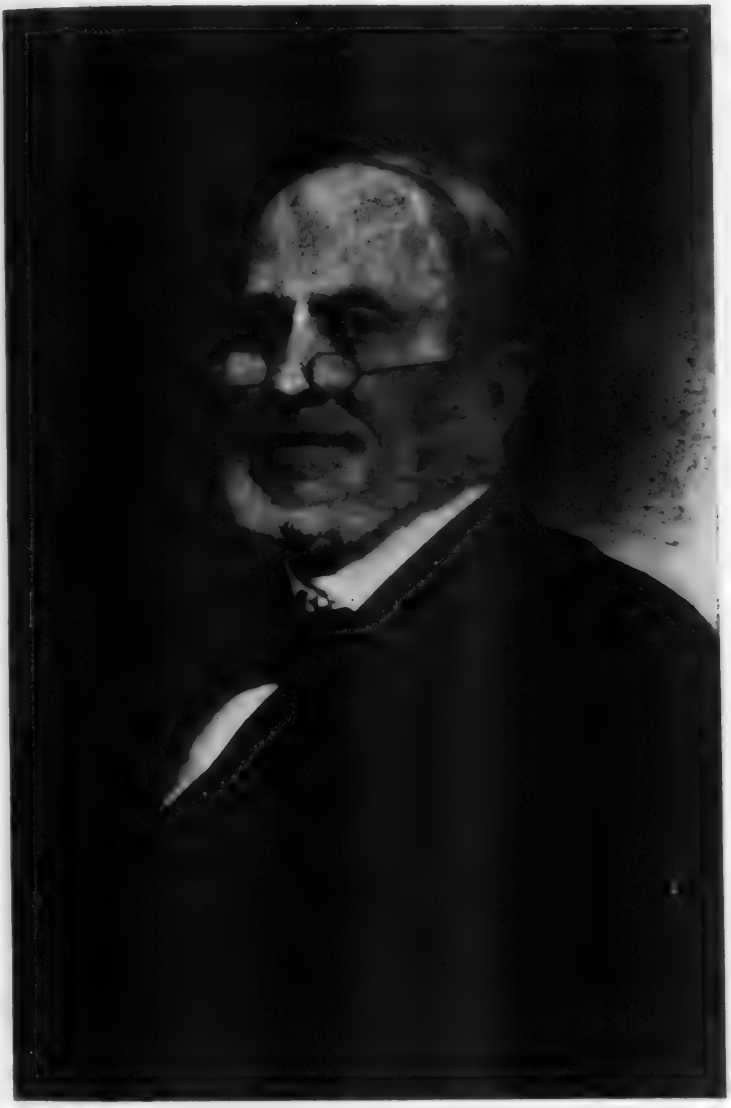


Fig. 2.

Dr. John Jennings Moorman, Resident Physician at White Sulphur Springs from 1838 to 1883.

Presented by Bruce Buford of Roanoke, Va.

1882, he married Miss Virginia A. Lightfoot, of Madison County, Virginia.

Dr. Dabney, of Charlottesville, was a medical consultant at the White between 1890 and 1896 and he was followed by Dr. J. Dorsey Cullen, of Richmond, in 1896.

Dr. Stuart McGuire, of Richmond, spent the summers of 1894, '95, '96 and '97 as physician to the Old White. He was a son of Dr. Hunter Holmes McGuire, the Medical Director of Stonewall Jackson's Army. He received his degree of M. D. from the University of Virginia in 1891, and later the degree of LL. D. from the University of Richmond. He was Professor of Surgery and for many years President of the Medical College of Virginia.

Dr. McGuire served as Lt. Colonel in the Medical Corps of the U. S. Army, and was Commanding Officer of Base Hospital 45 at Toul, France. He was awarded the Distinguished Service Medal of the United States, and the Medal of Honor of France.

Dr. Berwick B. Lanier, of Baltimore, was the resident physician in 1899 when the Greenbrier White Sulphur Springs was under the management of Mr. Harrington Mills who came from Washington, D. C. Dr. Lanier was a *bon vivant* and came of a distinguished family, but the gay life of Baltimore and the social whirl of White Sulphur no doubt had something to do with his early demise.

A beautifully illustrated folder describing the resort was published in 1899 with a map and excellent illustrations of Baltimore Row, Tansas Row and all the other rows including a rare view of First Virginia Row which remained until 1930. In that year the entire Greenbrier was rebuilt and its capacity doubled.

Dr. Robert Coalter Bryan was born in Henrico County, Virginia, in 1873. He studied for two years in the Engineering School of the University of Pennsylvania, where he took a great interest in athletics and was a popular member of the famous Mask and Wig Club. Previous to this he had spent two years at the University of Virginia; but he did not take a degree from either college. He then entered the College of Physicians and Surgeons of Columbia University and received his degree of M. D. in 1899.

Dr. Bryan served as resident physician at the Old White in 1903 and then began practice in Richmond, becoming professor of

anatomy in the University College of Medicine and, later, professor of genito-urinary surgery at the Medical College of Virginia and chief surgeon to Grace Hospital and to Stuart Circle Hospital.

Dr. Bryan served during the first World War, being at first a member of the commission of the American Red Cross to Rumania and then a surgeon with rank of major in the A. E. F. in France. While in France Dr. Bryan had the honor of rendering prompt and valuable aid to Marshal Foch who had met with an automobile accident, and Foch remembered this service when later he came to America and called to express gratitude.

Dr. Bryan was a member of the American Association of Genito-urinary Surgeons and of other important societies. He died December 24, 1941, after a long and disabling illness which he endured with rare fortitude, cared for throughout by a devoted wife.

Dr. H. Warren Buckler, of Baltimore, came to the White after Dr. Bryan and remained during the summers of 1904 and 1905. He was graduated from the Johns Hopkins Medical School under the old staff of Osler, Kelly, Welch and Halsted. Dr. Buckler has given special attention to the subject of anesthesia.

Dr. J. Garnett Nelson, of Richmond, was born in 1872 and died in March, 1930. He was graduated at the University College of Medicine and was member of the faculty of the Medical College of Virginia for many years. He was resident physician at White Sulphur in 1926. Later he returned to Richmond, where he died leaving two sons, both of whom graduated in medicine, and both are serving (1942) in our armed forces. One (Dr. Kinloch Nelson) was in the medical department of the McGuire clinic for years.

Dr. George Dwight Kahlo was born in 1866 and was graduated from Bellevue Hospital Medical College in 1891. He died at Old Point Comfort, February 12, 1916, of cerebral hemorrhage. Before studying medicine he had been secretary to the U. S. consul at Sydney, Australia, and later settled in Indianapolis. For several years he was professor of medicine and dean of the Central College of Physicians and Surgeons and later was professor of clinical medicine in the Indiana University School of Medicine. From 1908 to 1912 he was medical director at French Lick Springs, Indiana, going from there to White Sulphur Springs as medical director, April 4, 1913.

Dr. Kahlo made a trip to Europe in 1912 in order to observe the equipment and methods employed at foreign spas and he utilized this knowledge in association with the architects of White Sulphur Springs so that the present bathhouse immediately took rank as the best equipped in the United States.

Mrs. Kahlo survived him and is living at White Sulphur, his daughter, Olive, having married and removed to Middleburg, Va.

Dr. Kahlo was an honored member of the Americal Clinical and Climatological Association.

Dr. G. B. Capito was born in 1878 and received his degree in medicine from Columbia University in 1903. He came to the Greenbrier as an assistant to Dr. Kahlo in 1913 and assumed his duties when he was taken ill. After Dr. Kahlo's death Dr. H. G. Steele, of New York, became Dr. Capito's assistant and later on was succeeded by Dr. Kniffler. Dr. Capito stayed until the summer of 1917 when he volunteered for service in the World War and was accepted. He was a captain at General Hospital 42 at Fort McHenry. He later engaged in practice in Charleston, West Virginia, where he is actively engaged as a medical consultant. Dr. H. H. Roberts then assumed charge.

Dr. Harvey Hamilton Roberts, who was born in 1871, was graduated from the Medical College of Ohio in 1890 and in January, 1919, came to White Sulphur as Medical Director. He had had the advantages of European study in the clinics and hospitals of Berlin, Heidelberg and London, as well as of having made visits to Carlsbad, Baden Baden, Nauheim and Aix-les-Bains. He was medical director at Poland Spring for a time before coming to White Sulphur. In 1920 he resigned to enter private practice at Atlantic City after which he returned to his home in Georgetown, Ky.

While at White Sulphur he published a brochure called "Our Neglected Gold Mines" in which he stressed the great value of our mineral springs and our lack of appreciation of them. Other papers published by Dr. Roberts, while he was here were: "The Medical Treatment of Gastric and Duodenal Ulcer"; "Focal Points of Infection producing Toxemia"; "Functional and Organic Blood-pressure"; "The Therapeutic Value of the Spas and Health Resorts of America" (Med. Record, March 1, 1919).

Fig. 3.

An Historical Sketch of White Sulphur Springs.

The Presidents' House.

Dr. William Wirt Waddell, Jr., served as resident physician from July, 1921, until October, 1922. He had been graduated in medicine from the University of Virginia in 1918, from which he had already received the degree of A. B. He then served in World War I in the medical corps of the Navy as past Asst. Surgeon, U. S. N. R. On leaving White Sulphur he devoted himself to pediatrics in his alma mater where he taught and practiced for twenty years, attaining the rank of professor of pediatrics. His son was born while he was physician at the "Old White."

Dr. Kniffler was a practitioner at Wiesbaden, Germany. He remained at White Sulphur only a few months in 1917 and then went to New York where he engaged in practice, dying a few years later.

Drs. Ogilvie, Fisher and Wm. Edgar Myers served short terms. Dr. James J. Philips served in 1918-19. Dr. Quintard Taylor after service in the British and the American armies overseas in the first world war served with marked distinction as medical director for nearly six years. Drs. Taylor and Allison volunteered the day after President Wilson declared war and they served in the Presbyterian Hospital unit at Etretat, France. Dr. Taylor was later stationed at the Maudsley Neurological Hospital unit in London and he remained there under Sir Thomas Mott working on shell shock. Both Taylor and Allison were captains in the Medical Corps, U. S. Army.

After discharge from the army both Taylor and Allison went to White Sulphur but the latter remained only a year and a half, intending to devote himself to pediatrics, and he located at Hewlett, Long Island, where he is now in practice.

Both of Dr. Taylor's sons entered military service in World War II and Quintard, Jr., lost his life while flying in Central America, July 13, 1942.

During his White Sulphur period Taylor wrote an interesting history of the springs which was illustrated and served to preserve some of the traditions of the Old White. Drs. Taylor and Allison did a great deal to raise the standard of medical service at the Greenbrier. They had the first x-ray equipment and laboratory installed and added a full time laboratory technician to the staff. They also employed two full time trained nurses in the medical department

which they established on a sound basis. This involved much more than the bathing feature, as medicine was making great strides in all the specialties and patients demanded more and more accuracy in diagnosis and treatment.

Dr. Allison is a graduate of Dartmouth College in arts and of the College of Physicians and Surgeons of Columbia University in 1915. He served his internship at the Presbyterian Hospital in New York. He then entered the U. S. Army for 21 months with the French, British and American Armies.

At Hewlett Dr. Allison is director of the medical service of the Nassau Hospital in Mineola, L. I., and he is on the courtesy staff of four other Long Island hospitals and of the Presbyterian and Doctors' Hospital in New York. He is a fellow of the American College of Physicians and of the New York Academy of Medicine.

Dr. John Bankhead Banks' period as assistant physician was from October, 1922, to March, 1926, during which time he was associated with Dr. Taylor. In 1926 he left to engage in surgical practice and is now on the staff of the Charleston, West Virginia, General Hospital.

Dr. Hal W. Hogue was born in 1891 and graduated from Northwestern University Medical School in 1913. He served his internship in the Cook County Hospital in Chicago, took up private practice in Akron, Ohio, for nine years and then spent two years in practice in Evanston, Ill. On March 1, 1926, Dr. Hogue was appointed medical director and served in company with Dr. John F. Moriarty, his associate, until 1928. He died in Ohio in 1936.

Dr. John Francis Moriarty was born in 1897 and received the degree of M. D. from Jefferson Medical in 1924. After serving as resident physician until June 1, 1929, he entered the medical and surgical department of the Erie Railroad at Hoboken where he continues in service. Dr. Ambler B. Patton, of Hendersonville, North Carolina, a graduate of Northwestern University, was appointed medical director in 1928 and continued until June 1, 1929. His career was marked by strife with the resident physician. After he and Dr. Moriarty left it was only a week later that Dr. Patton died.

Dr. Alexander H. Sneddon, who came as resident physician when

Dr. Hinsdale took charge, was a native of Ohio and received a degree in Medicine from Jefferson Medical College in 1928 and had a post-graduate course in the Graduate School of the University of Pennsylvania. Dr. Sneddon showed ability, excellent training and engaging personal qualities. He remained for three years and then took up special practice in Cleveland in nose and throat surgery. He later removed to Cambridge, Ohio.

Dr. Floyd Hamilton Randall, who was graduated in medicine at the University of Michigan in 1899, served in the World War 1, attaining the rank of Lt. Colonel, Medical Corps. From 1935 to April, 1937, he was resident physician at the Greenbrier after which he removed to Van Wert, Ohio, where he died of diabetes September 16, 1937. He married Dr. Jean Pearson, a classmate at Ann Arbor, who survives him.

Dr. George M. Caldwell, who was graduated from the Medical Department of the University of Virginia in 1935, was previously graduated with the degree of A. B. from Roanoke College. He served over a year in the Hospital of the Tennessee Coal and Iron Co. at Birmingham, Ala., and also in the C. and O. Hospital in Clifton Forge, Va. In over six years of association with Dr. Caldwell the writer found him most faithful to his duties and most kind to his patients, both rich and poor. It would have been impossible to carry on the great responsibilities of this post successfully without wholehearted cooperation. Dr. Caldwell in the autumn of 1942 resigned to enter the United States Navy as a lieutenant in the medical corps. He was married on December 29, 1942, to Miss Dudley McKenna, of Stirling, Kentucky, at Norfolk where he was stationed at the Naval Hospital for five months before being ordered to sea duty. The last medical director, Dr. Hinsdale, came to the Greenbrier from Hot Springs, Virginia, where he had practiced at the Homestead for twenty-five years. He holds degrees from Amherst College and the University of Pennsylvania. After serving as resident physician in three Philadelphia hospitals he became assistant to the late Dr. S. Weir Mitchell and Dr. William Osler. For researches in neurology and climatology he has received valuable prizes from Harvard University, the College of Physicians of Philadelphia, and the Smithsonian Institution, Washington. He was Associate Professor of Medical Climatology in the University

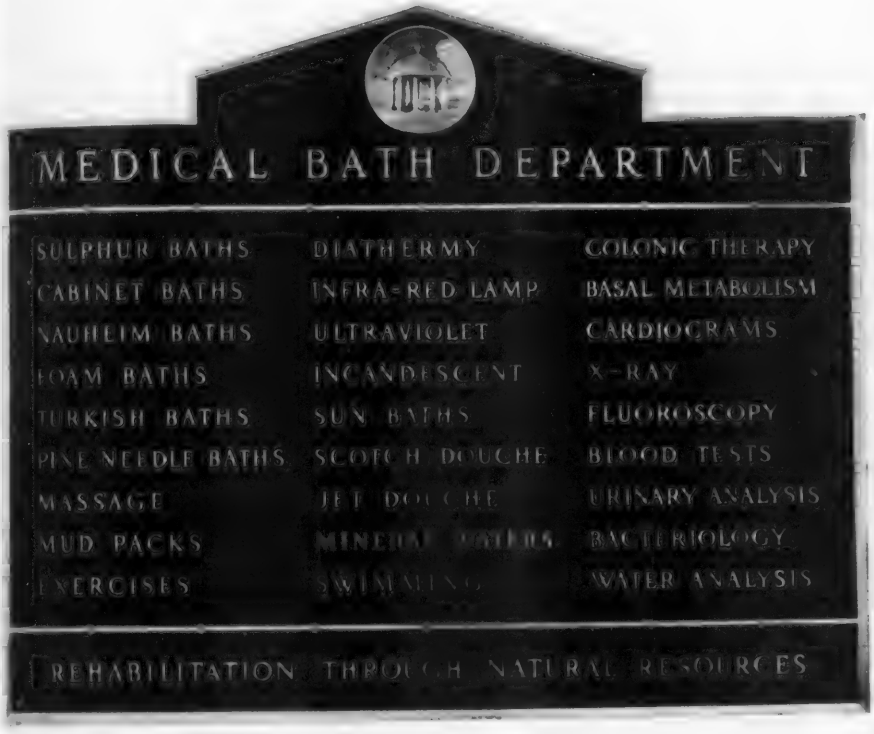

MEDICAL BATH DEPARTMENT
SULPHUR BATHS
CABINET BATHS
NAUHEIM BATHS
FOAM BATHS
TURKISH BATHS
PINE NEEDLE BATHS
MASSAGE
MUD PACKS
EXERCISES
DIATHERMY
INFRA-RED LAMP
ULTRAVIOLET
INCANDESCENT
SUN BATHS
SCOTCH DOUCHE
JET DOUCHE
SWIMMING
COLONIC THERAPY
BASAL METABOLISM
CARDIOGRAMS
X-RAY
FLUOROSCOPY
BLOOD TESTS
URINARY ANALYSIS
BACTERIOLOGY
WATER ANALYSIS
REHABILITATION THROUGH NATURAL RESOURCES

Fig. 4.

of Pennsylvania and president of the American Clinical and Climatological Association (1919).

Dr. Hinsdale is a fellow of the College of Physicians of Philadelphia, the American Neurological Association, the American Meteorological Society, the American Association of the History of Medicine, and of the Royal Society of Medicine, Great Britain. He is the American representative of the International Society of Medical Hydrology.

Dr. Hinsdale's service extended from 1929 to 1942 coinciding with the management of Mr. Loren R. Johnston and was terminated by the conversion of the Greenbrier into an army General Hospital.

The Greenbrier and the World War.

In 1941 we seemed remote from the war and its casualties. The year had been the most successful in the history of the resort. All went merrily as a marriage bell until the cannon's opening roar at Pearl Harbor. Then everything was changed and during the following six months we took care of over eighteen hundred enemy aliens. At first there were about five hundred Germans and these were increased to over a thousand. Then came the Italians, about three hundred of them, and as some of the internees were shifted to North Carolina, five hundred Japanese were sent over from Hot Springs, Virginia, where they had spent the winter at the luxurious Homestead. All internees were successfully cared for and as many as a thousand were at one time under our roof. The cottages were not opened for aliens.

To guard so many it was necessary to send seventy-five men of the immigration bureau and border patrol under the Department of Justice and F. B. I. men from the State Department. The outside men covered all approaches and no one was allowed to enter or leave without a pass card which gave the owner's description, finger print, etc. There were 18 sentry boxes at various points commanding the entrances and the armed guards were most strict in carrying out their instructions to the letter. As far as we know none tried to escape but some ingenious arguments were started to enable some of the more sophisticated to go to New York or other cities for special medical or surgical treatment. It was all futile as the medical department was fully able to handle any case that originated.

However, there was always the difficulty in regard to language. Some of those coming from Mexico, Central and South America spoke only Spanish and very little German. The Italians did not speak German, or did not speak to the Germans, and *vice versa*. There were three German doctors who were evidently much superior to their compatriots and lent valuable assistance. One of these was from Mexico City; another from Philadelphia and a third from South America. For various reasons they really dreaded going to Germany having spent many years on this side of the water and being apparently not in sympathy with the present German policy.

There was much speculation as to the attitude of some women in the German embassy. One of these was so critical and outspoken about the German policy that some thought it was a pose to bring out argument from our side so as to afford pointers as to our way of thinking. As far as the inscrutable Japanese were concerned no one paid any attention to them. They did not mingle with the others. Two babies were born to the Japanese in the hospital at Clifton Forge, Virginia. The boy was named Clifton and the girl Virginia. The border patrol accompanied these patients to the hospital and brought them back again. These men came from the Texas border and some were hired locally. It was a monotonous life for them—at least we thought so—but the change from the lowlands of Texas to the superb mountains of West Virginia was a great thing for these boys. But a winter night in a sentry box in the mountains was no trifling experience, especially when the climate is so radically different.

But all things come to an end and by July we were on our way to a most successful season,—so we thought. Then came an order from the War Department and a second period of service to the Government was inaugurated. In September all guests were out of the Greenbrier; all shops were emptied and nearly all the personnel gone. One can hardly visualize the confusion, the heart breaking farewells, as the hotel closed its doors and awaited the new order; and these were army orders.

Some of the old employees were immediately reengaged for duty but hundreds were suddenly idle. Instead of their regular pay check and the assurance from a hospital fund organized to look after the sick and wounded, they were suddenly left to their own resources.

Those who were reengaged by the army were given very liberal wages, in most cases much more than they previously earned. But there was a paternal care characteristic of the Greenbrier management that will undoubtedly be missed.

The transfer of the property included about 6,500 acres and the hotel with its 600 rooms and the forty cottages. Engineers soon began to appear and made a complete survey of the establishment and the necessary changes to convert it into a general hospital. Four new operating rooms were placed on an upper floor and all the latest equipment was installed. Two new elevators were built to bring men on cots to any part of the hospital, which was named Ashford General Hospital.

Nearly half a million dollars was spent for the necessary changes. The commanding officer, Col. Clyde M. Beck, is a veteran of the 90th Division of the first World War and has had experience at various posts in the Philippines, Panama, Hot Springs, Arkansas, and at a large army post, Camp Robinson, near Little Rock. His executive officer is Col. Sam F. Seeley, who has been active in the Procurement and Assignment Commission. The chief of surgery is Lt. Col. Daniel Elkin, professor of surgery in Emory University, Atlanta, Georgia. The chief of medicine is Major J. W. Pennock; of orthopedic surgery, Major Robert Kelley, lately of the Walter Reed Hospital; of pathology and bacteriology, Major R. A. Kilduffe. He died very suddenly of heart disease on April 5, 1943, while at his desk. He was head of the laboratory service and served with great distinction. He was a graduate in medicine of the Univ. of Penna., 1913, and served in the World War I. The chief nurse is Capt. Burdette Sherer, who had experience in the last war; and so on down the line.

They have at the present time, May 1, 1943, 300 patients and about 60 nurses. The patients have been transferred from overseas, some with very serious disablement and loss of limbs; but the latest measures are being adopted to fit them for some useful occupation.

When taps sound at the Ashford Hospital we think of the glorious record of the Greenbrier and at reveille we hail the day which will bring comfort to the wounded and peace at last to a war torn world.

SMALLPOX IMMUNIZATION OF THE AMERINDIAN

E. W. STEARN AND A. E. STEARN

Unless one is familiar with the history of variolation and vaccination he will be unable to judge properly the delayed protection of the Indian tribes by immunization. The practice of making one or more incisions (at first rather deep but later surface ones) on the body, and transferring into the wound pus from one of the pustules of a smallpox patient, called inoculation or variolation, was first practised by Dr. Zabdiel Boylston in 1721. Cotton Mather, a close friend of Dr. Boylston, had urged the latter to try this method as a protection against smallpox after having learned of it originally from his negro slave, Onesimus. From other negro slaves in Boston and vicinity he had learned of its wide application in Africa.

After its initial introduction into Europe and America, variolation remained a highly controversial subject during the entire period up to 1798, when vaccination began gradually to replace it. Variolation was always used with many misgivings. The induced disease was true smallpox, though generally milder than when contracted in a natural manner, and, in experienced hands, practice of the method resulted in one death in eighty to one hundred inoculations without the use of mercury, and one death in eight hundred to one thousand inoculations when mercury was used.[1] It was difficult to maintain even an approximately uniform dosage. The percentage of deaths was higher when the inoculation was performed by a layman. Reference may be made to one experience, when, during an attempt to halt an epidemic, traders at Fort Union, in 1837, inoculated thirty squaws with fatal results to nearly all.

Another hazard attached to this practice was the likelihood of spreading the infection, an effect which could not be controlled unless the inoculated persons were confined. This danger was officially recognized quite early, and inoculation hospitals were provided where the patient remained until the danger of contagion had passed. In many places variolation was forbidden. As late as 1776, when the American army was severely scourged with smallpox, soldiers variolated themselves. It was finally forbidden in the General Army Orders.

[1] Usually three grains of calomel, with ten grains of rhubarb or jalap.

In England, forty-four years after Jenner's first vaccination, variolation was declared a felony by Act of Parliament.

It is thus hardly to be expected that the North American Indians were at any time immunized against smallpox by variolation to an extent worth mentioning, even though in Europe, Asia, Africa, and even in America the method was practised with varying extensiveness and with considerable success between 1721 and 1798, and, even now, is resorted to when vaccine is not available.

In South America, a Carmelite missionary, seeing his flock dying about him during a severe epidemic, and having read in newspapers from Europe of the success of variolation, inoculated the remaining members of his mission in 1728. He seems to have been the first to immunize any of the Amerindians, and that with complete success.

Certain official attempts to introduce variolation into Latin America were made prior to 1779. At the time of the smallpox epidemic of that year the method proved to be of some value, but was not extensively used until the big epidemic of 1797 in southern Mexico and Guatemala. During this epidemic some sixty to seventy thousand natives were inoculated in the kingdom of New Spain (1). This, however, was accomplished primarily through the efforts of the clergy. In order to prevent the spread of the epidemic northward through Mexico and into California, it was ordered by the Viceroy that inoculation should be put into effect. It was thus given official sanction and support, and it is certain that more Mexican Indians were given protection by means of variolation than were Indians elsewhere.

The Indians, however, resisted the gratuitous efforts to protect them. In June 1796 (as quoted by Cook) Father J. M. Palacios wrote of the Mexican Indian: "These people are the most stubborn in the world. No reasons are sufficient to convince them of the benefits of inoculation. Some say God sent the disease into the town, but they will not permit the Spaniards to give it to more of their children" (2). This resistance to the efforts of the white man to protect the Indian from the scourge he most feared, and which, during the early years of conquest and settlement, was definitely the chief factor in the rapid decline of the native population, was difficult to meet.

Variolation was replaced by vaccination after Jenner's announcement in 1798 that cowpox, naturally or artificially transmitted to man,

is in itself harmless and protects the individual from smallpox. In July 1800, Dr. Benjamin Waterhouse received some vaccine virus from England and successfully vaccinated his own children. In 1801 he sent some of Jenner's vaccine to Thomas Jefferson, then President of the United States, who, in turn, used it with success on his children. President Jefferson, this same year, succeeded in having the first Indians vaccinated. From a letter written by Dr. Waterhouse to Dr. Spalding we find that the former had written to Jenner telling of the "diffusion of the blessings of his discovery among the tribes of Indians by the immediate agency of President Jefferson," for "a grand embassy of warriors were at Washington last winter (1801-02) when the President explained to them the precious donation which the Great Spirit had lately made the enlightened white man. He then caused all the warriors to be inoculated for the kinepox, and when they departed had the matter, with an abstract of the directions I had given to him, put into the hands of the interpreter, and told them that they would not only be secured by it from the smallpox, but that it would finally extirpate that disease from the earth" (3).

Convinced of the efficacy of vaccination, President Jefferson sent a letter on June 20, 1803, to Captain Meriwether Lewis of the First Regiment of Infantry, giving instructions as to how to foster friendship and understanding between the Indians and the United States government. The letter contained the following instructions: "Carry with you some matter of the kinepox. Inform those of them with whom you may be of its efficacy as a preservative from the smallpox; and instruct and encourage them (i. e. the Indians) in the use of it. This may be especially done wherever you winter." But in October 1803 Lewis writes to Jefferson, "I would thank you to forward me some vaccine matter, as I have reason to believe from several experiments made with what I have, that it has lost its virtue" (4). The Journals of Lewis and Clark make no further mention of vaccination, due probably to their inability to obtain vaccine. At the beginning of the 19th century this material was obtained either directly from Jenner or from the Vaccine Institution of London. The vaccine was sent on cotton thread which had been soaked repeatedly in eighth day virus. This vaccine was often worthless when available, due most likely to contamination, or possibly to improper methods of preservation and transportation. As late as 1898 the Indian Agent of

one of the New Mexico Agencies states that the whole history of the smallpox epidemic among the Zuni and other pueblos, which took place that year, " rests with the utter worthlessness of the vaccine points issued." He had used 9300 vaccine points on the Indians but had had only a few takes. He finally resorted to the purchase of vaccine crusts, and with them succeeded in vaccinating successfully, and in wiping the disease out of the pueblos (5). Arm to arm vaccination was practised widely during a large part of the 19th century due to the difficulty of obtaining effective vaccine. Waterhouse had to pay for the privilege of vaccinating children, which he did from time to time in order to keep the virus available.

According to Hanna, " no subject of medical or scientific interest has given rise to such controversy as that of the value of vaccination " (6) Thus it is nothing less than astonishing to find President Jefferson, less than five years after its discovery, so convinced of its efficacy that he makes serious efforts to protect, not the whites so much, but the troublesome indigenous population. This not only shows the good intentions of the government at that time, but is proof of the devastating effect of smallpox on the Indians and of its menace to their very existence.

The time was to come when, through the care of the government, the Indians were immune to smallpox, due to vaccination and revaccination at government expense, while the whites, often living adjacent to these immunized Indians, were victims of the disease, due to lack of effective public health laws and officials or to lack of means to be vaccinated. This difference between the unvaccinated whites and the vaccinated Indians is often mentioned by the Indian Agents and the medical officers of both the United States and Canada.

Others besides Jefferson were interested in the vaccination of the North American Indian in 1803. During this year, by order of his Catholic Majesty of Spain, an expedition under Dr. D. Francisco Xavier de Balmis travelled through New Spain and all the Spanish foreign possessions for the purpose of " propagating the vaccine." The account of this expedition, which appeared October 4, 1806, in the Madrid Gazette, states that the vaccine was established in every part of the northern hemisphere of America as far north as Sonora and Sinaloa. It is stated that that portion of the expedition which

visited Peru alone vaccinated fifty thousand persons. In reading this account of their travels, one is impressed by the vast territory of islands, as well as of Central and South America and Mexico which should have profited from this early program for vaccinating the natives. It is interesting to note that the expedition consisted not only of " members of the faculty and employees," but also of twenty-two children who were not immune to smallpox and who were destined to preserve the " precious fluid " by arm to arm transmission during the voyage. In this manner active vaccine was available, and this expedition had no such problem as the English encountered in carrying the pus in ships of the East India Company, which, on various occasions, arrived inert. Members of the Spanish expedition discovered cowpox in the valley of Atlixco, near the Pueblo de los Angeles, in Vallodolid of Michoacan, and around Calaboza of the province of Caracas (in Venezuela). They discovered the disease on the udders of the cows. Thus a source of vaccine from cowpox was available to continue vaccination against smallpox (7).

The expedition was divided into two sections. One section went to South America, while the other visited Cuba and Mexico. The only part of the present United States territory touched was part of Texas, but the influence of the group was felt among the clergy of California.

Only gradually were the ravages of smallpox checked in Cuba, where, a few years later, Dr. Tomas Romay with the help of Bishop Espada succeeded in bringing about vaccination on an extensive scale (8). Even as late as 1898 there were three thousand cases of smallpox in Santiago (Holguin) alone.

De Humboldt states that the virus for vaccination was brought to Mexico from North America several times by Don Thomas Murphy, who introduced vaccination into Mexico. Its introduction there, he says, found few obstacles since the cowpox appeared as a trivial malady, and because " the smallpox inoculation had already accustomed the Indians to the idea that it might be useful to submit to a temporary evil for the sake of evading a greater evil." * Though cowpox was known before the Balmis expedition arrived

* This statement, like others of the same author, is somewhat too optimistic. It must be questioned in the light of our knowledge of the almost century long resistance of many Indians to vaccination.

in Mexico, this expedition greatly promoted the practice of vaccination. In the principal cities of the kingdom "vaccine committees were formed, composed of enlightened individuals who, by vaccinating monthly, preserve the miasma from being lost" (9).

About this time (1804), according to the Spanish Archives of New Mexico, vaccination was introduced into Chihuahua. In 1806 official order was given to vaccinate the Indians of Acoma, Laguna and Zuni. In 1808 we read of the transmission of a paper of dry vaccine with instructions for its use. In 1809 a list of children who had been vaccinated in Santa Fe was transmitted to the Comandante-General Salcedo (10). However, in spite of these precautions, smallpox continued for almost a century to cause terrible mortality among the Indian population of this region. In August 1818 in a letter to John C. Calhoun, Secretary of War, from W. A. Trimble, we find the recommendation that "vaccine inoculation" should be introduced among the Indians, a "course dictated by humanity." Trimble had been impressed by the dreadful ravages among the Indians residing along the waters of the Red River and the Rio del Norte, when the Comanches lost four thousand souls (11). Also in 1821 the Rev. J. Morse, after fulfilling his commission to investigate the condition of the Indian tribes, wrote a recommendation to the Secretary of War to vaccinate the Indians as extensively as possible, giving examples of the ravages that smallpox was causing among various tribes. This recommendation, however, was ignored.

When, in 1820, the Yellowstone Expedition, designed primarily to establish military posts on the upper Missouri River for protecting the fur trade, controlling the Indian tribes and lessening the influence of British trading companies, visited Pawnee villages on Loup River, an effort was made to introduce vaccination among the Pawnee who, in common with other tribes, had suffered heavily from ravages of smallpox. But the attempt proved unsuccessful because the vaccine had been drenched by the wreck of one of the keel-boats of the Yellowstone Expedition (12).

In 1828 when smallpox began in the northern part of California, then in Mexican hands, and spread southward to San Diego, killing large numbers of both Mexicans and Indians, the authorities became interested in extensively vaccinating the Indians. James Pattie was released from prison by the Mexicans on the condition that he vac-

cinate the Indians of the missions of California. In his "Personal Narratives" he claims to have visited, in 1829, the missions along the coast, San Diego, San Juan Capistrano, San Gabriel, Los Angeles, Santa Barbara, Santa Inez, San Luis Obispo, San Miguel, La Soledad, Monterey and San Juan Bautista. During this journey he claims to have vaccinated twenty-two thousand persons, most of them Indians (13). Pattie's claim must be read with some misgivings, since, as an adventurer and a novice without training, it appears to have been a sizeable task for him. Cook gives an excellent discussion of Pattie's mission (14).

The expenses for vaccinating the Indians was first met by an appropriation made by the twenty-second congress during the presidency of Andrew Jackson, in 1832. The Act of May 5 states: "Be it enacted. . . . That it shall be the duty of several Indian Agents and sub-agents under the direction of the Secretary of War to take such measures as he shall deem most efficient to convene the Indian tribes in their respective towns, or in such other places and numbers and at such seasons as shall be most convenient to the Indian population, for the purpose of arresting the progress of smallpox among the several tribes by vaccination." The Secretary of War was empowered to employ as many physicians and surgeons as necessary, and, if necessary, two competent persons to conduct the physicians to remote Indians who were infected or in immediate danger of infection. The compensation of the physician was to be $6.00 per day. The Secretary of War was, furthermore, to supply all Indian Agents with genuine vaccine matter and was to use all proper means to persuade the Indians to submit to vaccination. All persons employed in the vaccination of the Indians were to give monthly reports to the War Department. To carry this act into effect the sum of $12,000 was appropriated. This sum could cover the expenses of no more than a beginning of vaccinating the Indians, who, in the official United States reports were estimated as numbering over 290,000 in 1832.

It may be of interest here to note that "an act to encourage vaccination" had been passed in 1813, while James Madison was president. It authorized the president to appoint an agent to preserve the genuine vaccine matter and to furnish it to citizens whenever it was applied for. This act was repealed in 1822.

Besides the Act of Congress mentioned above, several other events of interest happened in 1832. Some of the Assiniboin and Indians of other tribes along the northern branches of the Missouri River were vaccinated by a surgeon escorted to these tribes by Major Bean. It is reported that a total of twenty-six hundred Indians were treated at this time. Many of them manifested mistrust, saying, " Now we are well. If we should become sick it will be time enough to submit to the operation."

In May of this year Secretary Cass informed the Indian Agent John Dougherty, that one doctor, Meriwether Martin, had been appointed and that another one would be, but that no effort would be made " under any circumstances to send a surgeon higher up the Missouri than the Mandans, and I think not higher than the Arikarees." Vaccine matter with directions for its use was sent to Fort Pierre by the Upper Missouri Outfit during the summer of 1832. From the records of the 1836-40 smallpox epidemic among the tribes of the Missouri River as well as elsewhere on the continent, it is unlikely that large numbers of Indians had been vaccinated at this time. Vaccine was ordered by Fort Tecumseh in 1831. To what extent it was used, and what success attended its use, are not stated. However missionaries had vaccinated the Christian neophytes among the Skoyelpis at Kettle Falls of the Columbia River with the result that, during the 1838 epidemic, these suffered little while the Spokanes and other " unconverted " Indians were decimated in the epidemic (15).

Catlin states (16) that the government had succeeded in introduring vaccination in tribes which had already had a taste of the effects of smallpox, and that while he was on the upper Missouri River several surgeons had been sent with the Indian Agents into the country. He comments on the unsuccessful attempts which were made, and on how the confidence of the Indians in their own physicians rendered efforts ineffective until slaughter in their own tribe forced them to consent to submit to vaccination as at least a possible escape from the disease. The Indians found it hard to believe that so small a puncture in the arm was able to protect them from so fatal a disease. Besides, as " they see white men urging the operation so earnestly they decide that it must be some new mode or trick of the

pale face by which they hope to gain some new advantage over them," and so they stubbornly resist.

The treaty of 1836 between the United States and the Ottawas and Chippewas provided for the payment by the United States of $300 a year " for vaccine matter, medicines and the services of physicians, to be continued while the Indians remain on their reservations."

The natives of Alaska were first vaccinated during the severe epidemic of 1836-40. Dr. Blaschke, a German in charge of the medical staff of the company, together with the entire medical staff of the company, visited, under orders of Governor Kuprianoff, all of the villages in the Unalaska district. Besides this some of the vaccinators were sent to the Alaska peninsula, to Bristol Bay and Cook Inlet. But Dr. Blaschke stated officially that three thousand natives died before any vaccination was attempted, and that any effect was only barely perceptible for nearly a year. The superstitious Aleuts consented to vaccination only after a most peremptory order had been issued by the commander of the district (17) (18). Later on, in the Russian possessions, vaccination was performed on all children after they had reached a certain age.

The problem of vaccinating the Alaskan Indians is illumined by the following account. It is the record, written by a Russian, of the experience of his father in 1836, during the attempt to vaccinate the natives of Alaska. He says, " When my father and a surgeon's apprentice who was doing the vaccinating had followed the old man a short distance into the woods, they found themselves surrounded by a crowd of men, including one of the most powerful shamans. The shaman was exhorting the people to save themselves and their families from certain death by killing the vaccinators and burning their bodies, and a large fire for that purpose had already been started. The surgeon's apprentice gave himself up for lost, knelt down, and began to pray . . . my father, however, began to talk to the men, showed them the marks of vaccination on his own arm and on that of his companion, and called upon some of the Khutznu men, who had been to Novo Arkhangelsk, to say whether they had seen any of the Russians or Creoles die of the disease " (19).

Under the Act of Congress of 1839, $500.00 was spent for vacci-

nating the Indians in the superintendency of Michigan, i. e., in bands at various points where the disease had appeared.

In the official correspondence of James S. Calhoun, Indian Agent at Santa Fe, there appears a letter written by two doctors, Drs. Robinson and Thomas, in 1849. This is here quoted because it gives not only a statement of the prevalence and mortality of smallpox among the pueblos of New Mexico, but also the status that vaccination as a preventive for smallpox had achieved at the time. It was sent to Colonel Calhoun, and reads: "It has occurred to us that humanity would be benefitted by a thorough vaccination of the Pueblos under your government. The fatal and loathsome scourge, for which vaccination is a specific, almost always in its periodical visits to this country makes its appearance in their villages, where as anyone will inform you the mortality is frightful. Their confined and ill-ventilated apartments nourish and propagate the poison to such an extent that it is unsafe for the unprotected citizen to go within their atmosphere. We have been informed on creditable authority that smallpox or varioloid had not ceased to exist in one or the other pueblos for the last twenty years. IN ADDITION to the IMMEDIATE benefit realized by the Pueblos and our people generally, we may be forgiven for mentioning the INCIDENTAL benefit to the WORLD, which a close observation of the effects of vaccination on varioloid or smallpox in so large a body of men as the Pueblos nation, must necessarily produce" (20). Such a study would, indeed, have been of great value, as it would have included results on nearly forty thousand Indians, who had, with the acquisition of New Mexico, fallen under the immediate superintendence of the United States government. However, not until the end of the 19th century did successful vaccination of the Indians curtail the appalling death rate from smallpox.

The general problem of the protection of the Indians at this time is probably most clearly stated by E. T. Denig, well known clerk of the Upper Missouri Outfit, who, about 1854, wrote: "It is hardly conceivable how the smallpox among the Indians could be cured by any physician. All remedies fail. The disease kills a greater part of them before any eruption appears. We have personally tried experiments on nearly two hundred cases according to Thomas' "Domestic Medicine," varying the treatment in every possible form, but have

always failed, or in the few instances of success the disease has assumed such a mild form that medicines were unnecessary. It generally takes the confluent turn of the most malignant kind (when the patient does not die before the eruption) which in 95 out of 100 is fatal. It appears to be the natural curse of the red man, and here we leave it perfectly willing others should do more. We have tried from year to year to introduce general vaccination with kinepox among them and have even paid them to vaccinate their own children, but they will not have it done to any extent, and the few who will, do it more to please us than to benefit themselves. Moreover, should any accident happen or should the Indian miss his hunt, or any casualty befall him or his family, the vaccination would be blamed for it, and the good hearted operator would find himself in a position of danger and expense" (21).

Treaties with the various tribes provided for physicians and, in some cases, for hospitals, but the extent and character of the medical work carried on among the Indians is difficult to determine. By the year 1880, seventy-seven physicians were employed by the Indian service, but there were only four hospitals. Not until the first decade of the present century was medical work among the Indians regarded as one of the major activities of the Indian service. Before this time the efficiency of the medical work depended on the character of the physician appointed. Traders and priests frequently dispensed medicines and vaccine to the Indians with whom they came in contact. Government records and other source material give little indication of vaccination having been extensively or successfully employed among the Indians prior to 1850-1855.

In 1882 the United States government spent $1,430.35 for vaccination of Indians. Such a pittance was naturally not enough to secure vaccine material alone for over 300,000 Indians, many of whom had not been vaccinated or else needed revaccination. This inadequacy is shown by the 1883 epidemic in the Pueblo Agency in New Mexico, when thirty children at San Ildefonso and all of the unvaccinated children at San Juan died of smallpox (22).

In the May, 1900, Indian Legislation of the United States, an act was passed making appropriations of "$50,000., or so much thereof as may be necessary, to be immediately available in payment of liabilities already incurred, and for the amount necessary to be

expended in suppressing the smallpox in the Indian Territory among those residents of said territory not members of any Indian tribe or nation therein, all accounts to be first carefully examined and approved by the Secretary of the Interior as just and reasonable" (23). At the same time the United States Bureau of Census estimated the Indian population at 237,196 (which number may be compared with 262,988, the estimate of the Indian Bureau), giving, for the above appropriation, even if it were all spent in vaccination, an average permitted cost of less than twenty cents per operation.*

In 1909 $40,000 was appropriated to relieve distress and to provide for "the prevention and treatment of tuberculosis, trachoma, smallpox, and other contagious and infectious diseases" (26). This, the first of a series of *general* appropriations for the control of infectious disease, was succeeded by others, yearly appropriations being made for this purpose beginning with 1911.

During 1926 the total expenditure for medical work was approximately $1,300,000, of which $638,545.90 was spent for the relief of distress and prevention of diseases (27). The survey of the economic and social conditions of the Indians of the United States, made in this year by the Institute of Government Research, showed that cases of smallpox were now found only occasionally; vaccination had been compulsory in Indian schools since 1907, though it was stated as probable that a fairly large number of adults and children were still not immune (28). However this may be, of the total of 5,078 Indian deaths in 1938 from all causes, only ONE was caused by smallpox.

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TEXTS AND DOCUMENTS

MEDICAL EDUCATION AT McGILL IN THE SEVENTIES:

Excerpts from the "Autobiographie" of the Late Paul Zotique Hebert, M. D.

WILLIAM WHITE

When the last surviving member of the McGill University class of 1872—the class in which Sir William Osler received his degree in medicine—Paul Zotique Hebert, M. D., died last December at the age of 92, he left behind his *Autobiographie*: a 520-page volume of about 50,000 words written in a large, beautiful longhand script in French. Composed about 1905, the diary contains a prefatory note about himself which reads:

> Docteur en Médecine; Maitre en Chirurgie; Licencié du "Royal College of Physicians" de Londres; Agrégé de la "British Gynaecological Society" de Londres; Membre de la "British Medical Association"; Membre de la "Washington C° Medical Society" de l'Etat de New York; Membre de l'"Union Medical Society" de l'Etat de New York; Médecin attitré de 4 Sociétés françaises et allemandes à Londres, et enregistré légalement, en Angleterre, selon les lois médicales de l'Etat.

Dr Hebert was to the very last a dignified and stately old gentleman whose memory was very intact. When I last saw him in September, 1941, he was remarkably active and healthy for a man of his age: he still read widely, wrote with a steady hand, took long daily walks, and had a keen interest in the doings of modern medicine and the world in general. He had, of course, retired from practice and was living quietly with his niece in Los Angeles, California.

Of French heritage, Dr Hebert was born in St. Constant, P. Q., Canada, on 25 May, 1849, one month and eighteen days before Osler, who was born on 12 July. He attended Model School, St. Constant, and high school in Champlain, New York. With Osler, he studied medicine at McGill, and the two embryonic doctors were graduated in the class of 28 students on 28 March, 1872. A section

of the graduating program reads: " The gentlemen in order of merit who deserve mention: In the final examination, Messrs. Osler, Browne, Waugh, Marceau, Hebert, Pegg, St. John, and Morrison." [1] Osler's thesis, incidentally, was awarded a special prize.

Here the paths of Osler and Dr Hebert diverged: Osler journeyed to Europe, came back to teach at McGill, then Pennsylvania, Johns Hopkins, and finally Oxford as Regius Professor; Dr Hebert went into general practice at Whitehall, New York, for six years, practiced in San Francisco for one year, and then went to London to spend 33 years as general practitioner and gynaecologist. He was a Foundation Fellow and member of the council of the British Gynaecological Society, and served on the staff of its journal, from the inception of the organization until it was absorbed by the Royal Society of Medicine. Dr Hebert heard Osler's lectures at the Royal College of Physicians, London, on many occasions, and they met casually elsewhere. In 1911 he came back to this country, practiced in New York City and in up-state New York, became a member of several medical societies and a Fellow of the New York Academy of Medicine. And, after fifty years of service to the profession, which included a long list of contributions to journals, he retired in 1922.[2]

Dr Hebert's *Autobiographie* (so designated in gold on the spine of the bulky little volume) is concerned largely with his family, his early life in nineteenth century Canada, and his studies and later life as a doctor in San Francisco and London. Of greatest interest in medical history, it seems to me, are the two chapters on his days at McGill University and (briefly) practice in Whitehall, New York. The excerpt which follows is found on pp. 235-269 of the unpublished bound MS, and is entitled simply " Chapitre XI." Dr Hebert

[1] Cf. Harvey Cushing, *Life of Sir William Osler* (Oxford, 1926), I, 84-85. In Dr Hebert's copy of the program, which he showed me last year, he had placed, on the page listing the graduates, a red check-mark beside each name as he had heard of a new death. All but his and six others were checked off, and we learned, with the help of Dr W. W. Francis of Montreal, of the deaths of the six between 1925 and 1939. Dr William James Sharp, who died on 4 February 1939 in Toledo, Ohio, was the last of the six.

[2] For more details and a list of his articles, see William White, " Paul Z. Hebert, M. D.: 'The Last Leaf' of Osler's McGill Class of 1872," *The Bulletin of the Los Angeles County Medical Association*, LXXI (5 June 1941), 520-523.

recounts how he passed three examinations for entry into the College of Medicine, and was admitted on 2 October, 1869.

Trois jours après j'entrais au Collège de Médecine. Le programme d'enseignement y est divisé en deux parties, à savoir: les branches Primaires et les Finales. Il est obligatoire, avant de se présenter pour l'examen de réception, d'avoir suivi deux cours de chacune de ces branches, à l'exception de trois, dont il n'est requis qu'un cours, et qui sont la Botanique et la Zoologie, lesquelles sont comprises en un cour, et dont on peut passer l'examen, la première année, de plus, la Chimie pratique et la Jurisprudence Médicale. Il est d'habitude de suivre les Primaires, la première l'année, les Finales, la seconde; dans la troisième année, nous reprenons les Primaires, sur lesquelles nous passons un examen, à la fin de la Session, qu'on appelle " Examen des Primaires," et, dans la quatrième, nous reprenons le cours de Finales, pour la deuxième fois, afin de subir l'examen de réception à la fin de l'année. Les cours se donnent l'hiver et l'on peut suivre l'hôpital où la pratique d'un médecin l'été.

La première fois que j'entrai dans la salle de dissection, j'en fus tout dégoûté et je fus plusieurs semaines sans y retourner, après quoi, je m'y accoutumai comme les autres, et je n'ai jamais trouvé de raison, dans cela, de contracter l'habitude de boire ou de fumer, ce dont je me suis toujours abstenu.

Pendant la première session de mes cours, le 26 November 1869, à l'occasion d'une fête annuelle, observée par le Collège, en mémoire des Fondateurs et, pour cela, nommée "*Founders' Festival*," le prince Arthur d'Angleterre, maintenant Duc de Connaught,[8] alors, en visite dans la ville, assista à notre réunion et prit le souper avec nous. Nous avions composé, pour l'occasion, une chanson à son honneur que nous chantâmes en sa présence et dont j'ai encore une copie en ma possession. . . .

Au printemps, comme j'étais libre de le faire, je subis mon examen sur les cours de Botanique et de Zoologie le 16 Mars 1870, afin de n'avoir plus à m'en occuper.

La session étant terminée, j'avais à décider si je devais entrer chez

[8] This is the Duke of Connaught who died on 16 January 1942 at the age of 91.

un médecin ou suivre l'hôpital, et comme je passais dans la rue Ste C[4] j'observai une enseigne de médecin du même nom que moi. Je ne le connaissais pas du tout, mais j'y entrai et je fus bien accueilli. C'était un jeune homme qui n'avait guère plus de 30 ans. Son visage était étroit, sa barbe rousse, ses lèvres un peu pendantes. Il avait une habitude de se tenir le main droite sur la joue comme un homme qui aurait mal aux dents. Il était souvent distrait et avait un caractère excentrique. Il était déjà atteint de Phthisie pulmonaire et, malheureusement, il était adonné à l'usage immodéré de la boisson. Il s'était fait une bonne clientèle et tenait cheval et voiture. Je m'arrangeai sur-le-champ, pour suivre son bureau. . . .

A mon entrée chez le docteur J. C. N. Hebert, mon premier soin fut de me procurer un compendium de Médecine, qui traitait de toutes branches de cette science, en abrégé, et je me livrai, avec acharnement, à l'étude de ce livre, demandant les explications dont j'avais besoin, à mon patron, qui se prêtait, avec plaisir, à ce service, si bien qu'au bout de quelques mois, je possédais parfaitement la contenu de mon livre. De plus, mon patron s'était donné le peine de m'enseigner pratiquement, il n'avait guère de malades dont je ne connusse toute l'histoire pathologique et le traitement qui leur était appliqué. Il en était de même d'un Dispensaire, dont il était médecin où il ne manquait jamais de m'amener avec lui.

Vers cette époque, la maladie fatale, qui le minait, commença à faire des ravages sur son économie, et sa santé déclina à vue d'œil; souvent, maintenant, il était alité pendant plusieurs jours et même des semaines. Durant ce temps, je prenais charge de sa pratique exclusivement, tout en le consultant à la maison; mais, dès lors, le Dispensaire resta complètement à ma charge. L'automne arrive, il me conseilla de me hâter pour mes examens, m'assurant que j'avais les connaissances médicales de bien des élèves de trois ans, et m'offrant de me donner un certificat que j'avais suivi son bureau depuis le mois d'Octobre 1867, ce qui me vaudrait, au Collège, deux ans d'études, avant, même, que j'eusse commencé à étudier, et me mettrait en état de pouvoir me présenter pour mes Primaires au printemps, et pour mes Finales un an après.

[4] This blank space and others in the MS Dr Hebert had intended to fill in, but before I could finish my transcription and send it to him for correction and completion he had passed away.

Soit que son caractère et son goût excentriques le portassent à me conseiller de tenter une entreprise aussi exagérée; soit qu'il prévit, dans mon admission à la pratique, un moyen de préserver sa clientèle en s'association avec moi profitablement, se voyant incapable de continuer longtemps l'exercice de sa profession sans aide; soit encore qu'il voulût me considérer comme son fils et successeur voyant qu'il était marié depuis plusieurs anneés et n'avait pas d'enfants, il m'en parla souvent et essaya de m'y persuader, et, dans la condition d'ambition où je me trouvais, il me fallait bien peu d'encouragement, sans parler d'incitation, pour me faire tenter même l'impossible. J'y réfléchis sérieusement; mais je ne laissais pas de voir beaucoup plus de difficultés qu'il ne semblait en trouver. D'abord, il me fallait suivre trois cours en deux sessions et, pour pouvoir passer mes Primaires au printemps, je devais avoir suivi trois cours, c'est-à-dire deux de Primaires et un de Finales, il m'aurait donc fallu suivre double cours: les Primaires et les Finales ensemble, pendant cet hiver-là, ce qui demanderait le double d'argent à payer pour mes cours, et plus de livres à acheter, quand j'aurais le moitié moins de temps pour en gagner, et, au milieu de tout cela, où trouverais-je le temps d'étudier pour préparer mon examen du printemps; je craignais aussi qu'on ne découvrît cette affair de certificat au Collège; peut-être, viendrait-on à savoir que, pendant ce temps-là, j'etais commis chez B ; pourtant, si j'avais l'argent nécessaire, je m'y hasarderais. Plus j'y pensais, plus la chose semblait possible; il ne s'agit, me disais-je, que de tirer profit des occasions, en temps opportun et de surmonter les difficultés une par une, sans confusion, sans découragement, pour réussir dans toute entreprise. La première nuit que j'ai passée à Troy, j'étais loin de penser que, le lendemain soir, je serais pourvu de logement et de nourriture pour tout l'été, avec 16 dollars par mois de gages et, quand l'idée me vint d'étudier la Médecine, étais-je bien certain des 84 dollars qui devaient me mettre si à l'aise pour ma première session d'études; pour le moment, j'ai encore des élèves, autant que je veux, il surviendra bien quelque chose pour me tirer d'embarras; si je n'essaie pas, quel est celui qui fera des efforts pour moi? En fin, je quittai le docteur Hebert, pour entreprendre cette tâche, mais je ne devais plus retourner chez lui, car il mourut avant mon admission à la pratique.

La session commençait le 4 Octobre et je pris double cours, tant les Primaires que les Finales. Chacune des branches, qui composent ces deux divisions, est traitée par un professeur spécial et aucun d'eux ne peut avoir plus d'une branche à enseigner à la fois et, par conséquent, plus d'une lecture à donner par jour. Chaque lecture dure une heure et, à chaque heure de la journée, un nouveau professeur entre au Collège pour donner sa lecture. Maintenant, pour donner une idée de la tâche que j'avais entreprise, je vais passer en revue la manière dont j'employais mon temps, pendant une journée:

A 9 heures du matin, j'étais au Collège pour entendre la première lecture, sur la Physiologie, qui durait jusqu'à 10 heures; de 10 à 11 la Chirurgie; de 11 heures à midi, les Accouchements. A midi nous nous rendions à l'hôpital, qui se trouvait à dix minutes de marche du Collège, où nous recevions, en même temps, les Cliniques. Pendant ce temps, je dinais comme je pouvais, souvent en chemin, et, à 2 heures, je devais être de retour au Collège, pour la lecture d'Anatomie qui durait jusqu'à 3 heures. De 3 à 4, j'étais à la lecture de matière médicale; de 4 à 5, à celle de Pratique de Médecine, et de 5 à 6, j'assistais au cours de Principes de Chimie. A 6 heures, j'allais manger et ce qui me restait de temps, jusqu'à 8 heures, je l'employais à la dissection. A 8^{15} heures, je me rendais à la residence de Madame B , N° 9 rue N , pour donner ma leçon à H , qui durait jusqu'à 10^{15} heures. Je me trouvais, alors, en bon temps pour donner ma leçon aux commis que j'avais pour élèves et qui quittaient leurs magasins vers dix heures, et à 10^{30} heures, j'étais rendu au lieu où ils se réunissaient pour y être engagé, avec eux, jusqu'à minuit. Je me rendais, ensuite, chez moi, pour revoir les lectures que j'avais entendues dans le cours de la journée. J'étudiais jusqu'à 3, 4 ou 5 heures du matin, et à 9 heures le lendemain, ou plutôt le même matin, je devais avoir déjeuné et être rendu au Collège pour recommencer.

Chacun des professeurs faisait un examen hebdomadaire, en récapitulation de ce qu'il avait enseigné pendant la semaine. Un certain nombre de professeurs récapitulaient le vendredi, les autres, le lundi, ce qui divisait, pour les étudiants, les examens de semaine en deux. Pour les examens du lundi, j'avais grand temps à me, préparer le dimanche, mais pour ceux du vendredi, j'étais souvent obligé de passer la nuit précédente toute entière à étudier.

Il me semble, maintenant, que j'aurais peine à croire qu'un homme pût supporter une pareille tâche, sans succomber, si je n'eus, moi-même, passé par là, et je mettrais peut-être en doute l'exactitude de ma mémoire, si je n'avais devant moi, en ce moment, toutes les cartes des cours dont je viens de parler, avec certificat de les avoir suivis régulièrement.

Ma conduite ne fut pas sans attirer l'attention des étudiants, dont plusieurs ne voulant pas croire que je veillais si tard tous les soirs, vinrent eux-mêmes, à ma chambre, plusieurs fois, pour s'en assurer, et entre autres, un étudiant nommé J R M , qui y prit un intérêt tout particulier et me manifesta, ensuite, un grand attachement. Il avait pris place, en classe, à ma gauche, sur le banc de devant. J R M appartenait à une famille de fortune independante et demeurait dans un quartier aristocratique de la ville, N° 525 rue S , avec sa mère. Il avait fait des études classiques complètes et s'était d'abord livré à l'étude du droit, dans lequel il avait pris son doctorat et sans être entré en pratique, il était, maintenant, à étudier la Médecine. Son but était de se qualifier dans toutes les professions, sans en exercer aucune pour la raison qu'il n'en avait pas besoin pour vivre, dependant entièrement sur la fortune qu'il attendait de sa mère. Il avait une bibliothèque immense et n'entendait jamais parler d'un livre nouveau qu'il ne l'achetât. Il en avait trois chambres entourées d'étagères toutes remplies. Il était imbu de principes sceptiques et peut-être athéistiques. Il gardait, dans son cabinet d'étude, les bustes du Christ et de Voltaire qu'il plaçait face à face l'un de l'autre et il prétendait les avoir sur en même niveau dans son appreciation, disant que le dernier avait défait ce que la premier avait fait, en parlant de la religion chrétienne. Il n'avait guère plus de 40 ans, mais ses cheveux étaient blancs comme la neige. Il m'invita souvent d'aller le voir. J'y allai quelquefois et sur sa demande, j'echangeai de photographie avec lui. Pour une des miennes, il n'en donna deux des siennes, sur l'une desquelles que j'ai maintenant, devant moi, il écrivit une note, en anglais, dont voici la traduction exacte:

A mon ami, Mr Zotique Hebert, l'étudiant le plus perséverant et le plus infatigable que je connais dans le Collège, qui s'assied à ma

droite, sur le banc de devant, avec la colonne de fer devant et entre nous.

13 Decbre 1870

J R M

Je continuai ainsi jusqu'à au printemps. J'étudiais en mangeant, j'étudiais en marchant; jamais on ne me voyait dans la rue sans un livre à la main, tant qu'il faisat assez clair pour lire et, pendant mes veilles, souvent, épuisé de fatigue, accablé de sommeil, mais n'ayant pas encore fini ma tâche du jour, je me couchais tout habillé, laissant ma lampe allumée pour ne pas m'endormir jusqu'au matin, et je me levais au bout d'une demi-heure ou d'une heure pour finir mon ouvrage. Mon sommeil était quelquefois remarquable. On ne saurait croire les phénomènes extraordinaires qui peuvent s'opérer dans une imagination continuellement surexitée: Il arrivait souvent que je me couchais, n'ayant encore ma leçon dans l'esprit que d'une manière confuse et je me levais le matin, la sachant parfaitement bien et je me rappelais d'y avoir rêvé. La première fois, que j'ai fait cette observation, fut à l'occasion d'un examen de semaine que j'étais en voie de préparer; j'avais déjà repassé ma leçon plusieurs fois sans avoir pu me la fixer dans l'idée, ma mémoire semblait se refuser à faire l'effort necessaire pour le retenir; je me couchai tout habillé, comme je faisais quelquefois et ne m'éveillai que la matin, à temps pour déjeuner à la hâte et courir au Collège. Chemin faisant je tâchai de rappeler à ma mémoire ce que j'avais lu avant de me mettre au lit. Je m'apercus, alors, que je savais très bien ma leçon et que j'y avais rêvé toute la nuit, et j'en conclus que la légère impression produite dans mon esprit par la lecture de ma leçon, au moment de me coucher, s'y était gravée plus profondément, pendant mon sommeil en y rêvant.

La saison s'avançait et le temps de faire inscrire son nom, comme candidat, pour l'examen des Primaires, approchait, cependant, tous les efforts que j'avais fait, tous les moyens dont je m'étais prévalu, n'avaient pas suffi pour me procurer l'argent qu'il me fallait pour payer tous mes cours, et, après avoir épuisé toutes mes ressources, il me restait encore 6 cartes non payées, à $12 (dollars) chaque, que je me pouvais solder.

Les étudiants étaient tenus, selon les règlements du Collège de payer tous leurs cours d'avance, mais, sur ce point, on n'était pas très strict et on les laissait négliger jusque vers la fin de la session; mais, en revanche, on menaçait d'annuler les cours de ceux qui ne payaient pas, au moins, à la fin de la session.

J'étais bien peiné, mais je ne perdis pas espérance, et, comme dans toutes les autres occasions de ma vie, où j'éprouvai des difficultés, je redoublai de courage, au lieu de me désespérer; je n'abandonnai pas, même, l'idée de me faire recevoir au même temps. J'avais entendu parler de plusieurs étudiants de troisième année qui s'étaient mis en pratique et avaient bien réussi; j'irais faire de même pendant l'été, je reviendrais, à l'automne, reprendre encore tous les cours et je passerais mes deux examens: des Primaires et des Finales, ensemble, à la fin de la session. Je n'y voyais rien d'impossible, ni même de si difficile que ce que j'avais fait pendant la session qui finissait, si, seulement, je rapportais assez d'argent pour n'avoir pas besoin l'enseigner, et je ne pouvais pas croire qu'en expliquant mes raisons aux professeurs, on me refusât mes cartes quand je me présenterais avec l'argent pour les payer dans l'automne. Mes projets étaient formés, mais, j'étais, tout de même, triste et pensif à ce sujet, et mon voisin J R M m'en avait déjà fait la remarque, cependant, il n'avait pas insisté à en savoir la cause, mais soit qu'il se doutât de ma condition ou qu'il parlât sans s'occuper particulièrement de moi, il me demanda, peu après, combien je pensais qu'il y aurait d'étudiants qui se présenteraient pour leurs Primaires et qui je croyais qu'ils étaient. Je lui répondis que je ne le savais pas beaucoup. Il commença à en nommer, en les comptant sur les doigts et, après en avoir enuméré plusieurs, me montrant du doigt, il dit: Et toi. Je lui répondis, non, pas moi. Pourquoi, demanda-t-il? Parce que je ne suis pas préparé. Allons donc, dit-il, si j'avais répondu la moitié aussi bien que toi, je serais déjà sur la liste. Enfin, lui dis-je, nous n'avons pas tous la même confiance en soi. Ah! ça, par exemple, ajouta-t-il, quand un élève peut disputer la palme à aucun du Collège, il n'y a pas tant à hésiter que cela, et il ne faut pas oublier que l'hésitation peut, dans certains cas, degénérer en faiblesse. Eh! bien, lui dis-je, j'y réfléchirai encore. Je l'espère, dit-il, en me serrant la main, puis il s'éloigna.

Après cela, chaque fois qu'il me rencontrait, il me parlait de mon examen, jusqu'à ce qu'enfin, je ne me sentis plus capable de lui cacher le véritable nature de mon manque de preparation, et, quand je lui eus dit, il me demanda combien de cartes il me manquait. Six, lui dis-je. 72 dollars ((c-à-d 360 frs), remarqua-t-il, c'est plus que je ne pourrais obtenir sans en parler à ma mère, qui me les refuserait si elle ne savait pas ce que je me propose d'en faire, mais je pourrais t'en procurer 25 et, si tu veux, me permettre d'en parler à une couple d'amis, je vais voir ce que je puis faire. Je lui répondis que je n'y avais aucune objection. Le lendemain, il arriva au Collège avec toutes mes cartes, qu'il me donna et me présenta trois billets promissoires à signer, dont l'un de 26 dollars, en sa faveur, comprenait le prix de deux cartes et des timbres nécessaires pour legaliser les trois billets, &c, et les deux autres étaient de 24 dollars chaque, ayant la place de noms en blanc. Je lui dis que je ne pouvais, par aucuns termes, lui exprimer toute ma reconaissance et que la plus grande crainte que j'avais, était de ne pouvoir lui rendre le montant aussitôt que je le voudrais. Il me dit de ne pas me troubler, à ce sujet, que personne d'eux ne s'attendait à ce que je pusse les payer avant plusieurs années, voyant que j'avais encore une année d'étude à faire, que, si je pouvais leur rembourser la somme dans l'escape de cinq ans, ils seraient tous trois satisfaits; mais que, d'ailleurs ils ne me la demanderaient jamais et que, pour cette raison, les deux amis, qui avaient coopéré avec lui, l'avaient fait à condition que leurs noms ne fussent pas mentionnés; autrement, dit-il, on ne m'aurait pas demandé de signer de billets du tout. Enfin, je signai les billets et j'allai, sur-le-champ, faire inscrire mon nom comme candidat pour l'examen des Primaires, que je passai le 21 April 1871, et je réussis bien, étant au nombre de ceux dont il fut fait mention honorable.

Chapitre XII

[The first portion of the chapter has to do with matters outside of medical education. Dr. Hebert then renews his reminiscences of his education at McGill.]

J'avais toujours conservé l'idée de me mettre en pratique, à la fin de la session, pour me faire un peu d'argent; en consequence, aussitôt que j'eus passé mon examen des Primaires, je commençai

à me preparer à m'eloigner et, au bout de quelque jours, j'étais sur mon depart . . . , et je me dirigeai vers Troy, que je fus content de revoir; mais je ne crus pas devoir m'y fixer; je me rendis à Albany où je rencontrai un Docteur Crowthers, qui venait s'y établir, ayant quitté West Galway, où il me conseilla d'aller, me donnant une lettre de recommendation, addressée au ministre du lieu et je partis; mais, au lieu d'aller à West Galway, je revins sur mes pas et me rendis à Whitehall, N. Y., petite ville prospère, de 7 à 8000 âmes, située à l'extrémité sud du lac Champlain. Je visitai le prêtre du lieu, Revd A T , à qui je fis part des circonstances où je me trouvais. Il me recommanda d'agir avec prudence, vu que je m'avais pas mon diplôme et que j'étais si jeune, ne devant compléter ma 22^{ième} année qu' à la fin du mois de Mai. Je résolus de me fixer à cet endroit.

Dès le commencement, j'eus une pratique surprenante et lucrative, si bien qu'au milieu de l'été, étant appelé à faire une opération pour l'extirpation d'un cancer du sein; je me rendis à M pour acheter les instruments dont j'avais besoin, avec assez d'argent pour aussi solder mes trois billets promissoires qui se trouvaient dans les mains de J R M ; il hésita beaucoup à prendre l'argent, m'assurant qu'ils seraient tous trois contents d'attendre jusqu'après ma réception, attendu que je pourrais en avoir besoin pour la session d'hiver. Je lui racontai le succès que j'avais rencontré en pratique et lui dis que j'espérais revenir dans l'automne, avec plus d'argent que je n'avais, alors. Je lui laissai l'argent et je puis dire que je n'eprouvai guère, de ma vie, de plus grand plaisir que celui de pouvoir acquitter cette dette, à ce temps-là. Je tâchai de lui exprimer toute ma reconnaissance et je retournai a Whitehall, où je demeurai jusqu'à l'automne et je revins à M pour le temps des cours.

Cette session fut, pour moi, un temps de repos, comparativement à l'hiver, précédent. Je n'avais plus besoin d'enseigner, mais, comme mon ancien élève H B désirait encore continuer sa classe, je me rendis à son désir, et Madame G me pria de donner des leçons à A et à M L , sa plus jeune demoiselle. . . .

An printemps, je subis mon examen final le 28 Mars 1872, étant inscrit le cinquième dans la classe d'honneur, composée de 8 dont la plupart étaient des élèves de 5 ou 6 ans d'étude.

Il est d'habitude dans ce Collège, quand les professeurs trouvent

qu'un grand nombre d'élèves passent un examen plus brillant qu'à l'ordinaire ou manifestent un degré inaccoutumé de talent et de connaissance, de signifier cette circonstance en portant des gants blancs à l'occasion de la proclamation des candidats qui ont réussi dans leur examen et en délivrant leurs diplômes. L'année, que je fus reçu médecin, fut signalée par cette distinction, qui arrive assez rarement.

[In this first year of practice in Whitehall, Dr Hebert had an interesting experience, of which he writes.]

Dans l'été de 1872, ayant été appelé à un cas rare, je préparai un article, à ce sujet, intitulé: "*Expulsion spontanée dans un cas de Présentation de l'épaule*" et je l'envoyai à l'éditeur du "Canadian Medical & Surgical Journal," qui le publia avec plaisir.

Dans l'automne, je fus appelé à un cas de mort subite d'une femme, dont le mari a été soupçonné de l'avoir enpoisonnée. On tint une enquête sur son cadavre et, au lieu de m'employer pour faire l'autopsie, comme il aurait été ordinaire de faire dans un cas où j'étais le seul médecin qui avait vu la personne au moment de sa mort, on fit venir deux autres médecins et je fus exclu de prendre part à l'enquête. On voulut, ensuite, me questionner comme expert. Je répondis sur les faites simples, mais je refusai de répondre à toute question d'opinion qu'on me fit, à moins qu'on ne me payât mes honoraires, ce qui causa beaucoup de bruit. Un magistrat conseilla au coronaire de me faire emprisoner pour ne pas vouloir répondre mais je persistai dans ma détermination et le coronaire n'osa pas aller plus loin. Beaucoup de remarques parurent dans les journaux à mon sujet; alors, j'écrivis un article pour défendre mes droits et exposer les fautes de ceux qui m'avaient abusé, je le portais au bureau de l'un des deux journaux du lieu, mais on refusa de le publier; je me présentai à l'éditeur de l'autre journal, qui en fit autant, je fis, alors, imprimer, à mes frais, plusieurs centaines d'affiches à la main que je fis distribuer dans toute la ville. On ne répondit pas à mon affiche, qui sembla mettre fin à la discussion, et l'éditeur du Journal médical qui avait publié, pour moi, l'article dont j'ai parlé plus haut, ayant obtenu une de mes affiches, la publia dans son journal, sans que j'en susse rien à ce temps-là, car je ne lui en avais pas envoyé de copie, de crainte

qu'il ne m'accueillît de la même manière que les éditeurs des deux journaux auxquels je m'étais adressé auparavant. Je m'aperçus bien, ensuite, que cette affiche avait eu l'effet d'améliorer ma clientèle et je fus souvent choisie, dans la suite, pour faire des autopsies, dans d'autre circonstances.[5]

[5] It is a pleasure to acknowledge my indebtedness to Miss Dora Le Gault, Dr Hebert's niece, without whose help this article would have been impossible: for giving permission for the publication of these excerpts from the *Autobiographie* and for checking my MS.

NOTES AND COMMENTS

FIELDING H. GARRISON, THE CADUCEUS, AND THE UNITED STATES ARMY MEDICAL DEPARTMENT

HARRY L. ARNOLD, JR.

Astonishingly few physicians are aware of the fact that the proper emblem of medicine is the single-serpent-entwined staff of Aesculapius and not the two-serpent-entwined (and, since about 250 B. C., winged) wand of Hermes or Mercury, which was known to the Greeks as the *kerykeion* and to the Romans as the *caduceus*. Frothingham [1] and Boetzkes [2] have clearly traced the caduceus back to the twin-serpent emblem of the Babylonian messenger-god, Ningishzida, from whom Hermes was derived. The conclusion that the caduceus stands originally and primarily for peaceful message-bearing, or for peaceful or commercial pursuits generally as contrasted to military activities, is of course inescapable. In a previous publication,[3] I presented some previously unrecognized aspects of the history of the caduceus and of its present-day widespread misuse (by the medical section of the Office of Civilian Defense, for example) as a medical insigne.

The late Fielding Garrison, in a series of papers published between 1919 and 1932,[4] has somewhat confused the issue by insisting that Hermes and Mercury possessed a sufficient number of medical attributes and functions to justify the use by the United States Army of their emblem, the caduceus, as a medical symbol. In the following letter, written a few weeks before his death, he expressed himself rather more frankly than in any of his published articles on the subject.

[1] Frothingham, A. L.: Am. Jour. Arch., 20:175 (Apr.-June), 1916.

[2] Boetzkes, R.: Das Kerykeion, Inaugural Dissertation, University of Munster, 1913.

[3] Arnold, H. L., Jr.: Serpent-Emblems of Medicine, J. Michigan M. Soc. 36:157 (March), 1937.

[4] Garrison, F. H.: The Use of the Caduceus in the Insignia of the Army Medical Officer, Bull. M. Library A. 9:2 (Oct.), 1919; The Prehistory of the Caduceus, J. A. M. A. 72:1483 (May 17), 1919; *ibid.*, Mil. Surgeon 44:633, 1919; Review

March 18, 1935

Mr. Harry L. Arnold, Jr.,
749 E. University,
Ann Arbor, Mich.

Dear Mr. Arnold:

In reply to your letter of March 12, the best historical articles on the caduceus and the Aesculapian staff are the following:

Waldemar Deonna: Emblèmes médicaux, etc., Rév. internat. de la Croix-Rouge, Genève, 1933, XV, nos. 170-172 (February-April).
Lenoury: Le caducée à travers les âges [*sic*], Paris dissertation (Medical), 1925.
Ward, W. H.: The Seal Cylinders of Western Asia (Carnegie Institution). 4°. Washington, 1910, pp. 127-131.
Pauly-Wissowa: Real. Encycl. d. class. Wissensch., Stuttgart, 1913, VII, 788.
W. H. Röscher: Ausfürliches Lexikon der griech. u. römischen Mythologie, Leipzig, 1884-6, I, 1. Abth., 629.

In this connection, please note that my articles in the Military Surgeon, Washington, 1919, XLIV, 633; 1926, LVIII, 224; 1932, 129-132 are polemic, i. e. in the nature of lawyers' briefs, along the following lines:

1. On the Coat of Arms of the Medical Department of the U. S. Army, which includes the nursing, dental, veterinary and civilian personnel, in fact, the whole outfit, we have used, since 1818, the Aesculapian staff, with single serpent entwined, as a medical symbol, as in the Medical Departments of European Armies and even the Aesculapian rooster.

2. On the collars and chevrons of the medical officers and enlisted men of the Medical Corps of our Army, we employ the Caduceus, not as a medical but as an administrative symbol, implying the neutral, non-combatant status of this personnel on the field of battle; which was a *Roman* not a Greek usage;[5] i. e. in the Roman Army, the Caduceus was borne aloft by heralds on a battle front, like a modern flag of truce, to imply peaceful or quasi-commercial transactions, e. g., the exchange of prisoners. This usage is in accord with the symbolism attached to Mercury, as the god of commerce, and explains its usage by Froben, Churchill and other printers of medical books.[6] The French now call the Aesculapian staff, the *Medical*

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of La caducée au cours des âges, by Louis Lenoury, Mil. Surgeon 58: 224, 1926; A Lucubration on the Caduceus, Mil. Surgeon 71: 129 (Aug.), 1932.

[5] It was a Greek usage as well, and a very old one. Boetzkes[8] relates the story that messengers were once sent from Athens to a neighboring city "aneu kerykeiou,"—without the kerykeion—to indicate that the feeling between the two cities was so friendly that no outward sign of peaceful intent was needed. An emblem that is eloquent by virtue of its absence must be a familiar one indeed!

[6] "Froben . . . and other printers of medical books" is a familiar phrase in the

Caduceus and the Mercury (2 serpent) staff the *Commercial* Caduceus. I have taken the above line, because so many officious and idle-minded persons are always trying to have the collar ornament of our Medical Corps changed over to an Aesculapian staff, as in the British or Mexican armies. Our contention is that the Caduceus not only differentiates our medical administrative personnel from those of other armies, but that it is historically justified by Roman usage. No one knows why it was introduced in our Medical Corps in 1856, nor why the Caduceus was borne aloft by beadles at Caius College[7] or by beadles at ceremonials of the Paris Medical Faculty (See Charcot's famous caricature of his colleagues of the Paris Faculty in Indian file). That point might well be worthy of your investigation, if you can get at the inwardness of it. When they press us too hard,[8] I have taken the line that in the last analysis, Mercury had as many medical functions as

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literature on the caduceus. I have been unable to find any evidence whatever to support it, and Garrison himself offers none. Heckethorn (The Printers of Basle, London, Unwin Bros., 1897) gives what is by inference a complete or nearly complete list of Froben imprints. There are 256 of them, and only one—a folio edition of Plutarch's Preservation of Good Health—has any medical connotation whatever. Edwin S. Potter, the author of Serpents in Symbolism, Art, and Medicine, undertook further investigations of the same subject and was unable to enlarge Heckethorn's list. An examination of a large number of medical books printed in the period (the first half of the 16th century) under discussion showed that none of them bore the mark of *any* Basle printer. I believe Froben used the caduceus because it illustrated a Biblical admonition, with which he sometimes printed it: "Be ye wise as serpents, and without guile as doves." (He used it without wings, in its ancient form, and with a dove perched on top.)

Churchill, of course, *was* a "medical printer." His reason for using the caduceus as an emblem, however, is well shown, I think, by the fact that the serpents in his version of it were labelled "medicine" and "letters" respectively, and that the ring enclosing the whole emblem bore the inscription "irrupta tenet copula"—(whom an) unbreakable bond unites.

[7] This has puzzled other writers. Still others, more ingenuous, have hailed it as a medical use of the emblem. Personally, I am puzzled by both attitudes. Dr. John Caius (Keyes) was a graduate of Gonville Hall, and when in later years he became affluent, he endowed the school. In gratitude (it must have been quite a bequest!) they changed the name of the institution to Gonville and Caius College, and invited him to attend the ceremonies. He came, and at the appropriate moment presented the school with a silver caduceus, and with it a few explanatory remarks in Latin. Here is what he said: "For the caduceus, or silver rod (*virge argentina*), means that one ought to rule more gently and kindly than they used to do, who ruled with an iron rod. Moreover the serpents, signs of prudence, mean that one ought to rule and act with prudence." Is it any wonder that the school kept the caduceus as its own emblem thereafter? I think not.

[8] This is the most important phrase in the whole letter. It clearly shows that Garrison was contemptuous of the arguments he had been compelled to advance in favor of the medical use of the caduceus.

any other major god (See Pauly Wissowa or my article in Military Surgeon, August, 1932, pp. 130-131). (Please note that the title of the late Dr. W. A. Jayne's book, "The *Healing* Gods, etc." (New Haven, 1925) is a misnomer, if purely medical gods are implied.) There never was a medical god *sensu strictu*, unless perhaps the Mexican Ixlilton. Even Aesculapius was only a demi-god, deified when destroyed by a bolt of Zeus; but all the major gods, of whatever mythologies, had medical functions, i. e. could *inflict* as well as avert or cure disease. When it comes to the beneficent function of *healing* alone, Mercury has as many instances to his credit as Aesculapius himself, and on one Greek inscription, he is actually styled a "physician." Nevertheless, I have always agreed, with whatever authority or opponent, that the Aesculapian staff is the authentic symbol of Greek medicine. That, however, has nothing whatever to do with the purely *administrative* use of the Caduceus in the Roman Army or in the Medical Corps of our Army.

By "medical printers," I meant, of course, printers of medical books of which Froben published not a few.[6] The caduceus was first employed by Erhard Ratdolt, the printer of incunabula in 1486.

Trusting this will be of help, I am

Very sincerely yours,

(s) F. H. Garrison
F. H. Garrison
Librarian

It is apparent from this document that Garrison did not feel that the caduceus was a proper emblem to use for the purpose of distinguishing an organization as medical. His insistence on the medical functions of Mercury and Hermes was justified only by the necessity, as he saw it, of defending the U. S. Army's use of the caduceus against "officious and idle-minded persons." And even then he advanced this argument only when pressed "too hard."

Whether the caduceus was originally adopted by the U. S. Army Medical Department as a medical or as a non-combatant emblem, we do not know. The fact that it is now used not only by physicians, nurses, dentists, veterinarians and officers of the Sanitary Corps but also by officers of the Medical Administrative Corps and on blankets, dishware, silverware and the like suggests that its present use is indeed not medical but administrative. Moreover, the Coat of Arms, which contains the single-serpent-entwined Aesculapian staff, is now officially attributed not to the entire Medical Department but only to its strictly medical subdivision, the Medical Corps.

NOTES ON THE RECEPTION AND INFLUENCE OF WILLIAM BEAUMONT'S DISCOVERY

GEORGE ROSEN

In the January issue of the *Bulletin* there appeared a review by Genevieve Miller [1] of the present writer's study on *The Reception of William Beaumont's Discovery in Europe*.[2] In her review, Miss Miller corrects my statement that little notice was taken of Beaumont's work in Britain until 1838, when Langston Parker mentioned it in a book on the stomach, and Andrew Combe issued the Edinburgh edition; and in France until 1843 when Blondlot published his researches on human and animal digestion. She points out that there are already frequent references to Beaumont's work in the first edition of Andrew Combe's *Physiology of Digestion* which appeared in 1836; that Edward Livingston, Ambassador to France, had called the attention of Orfila, Dean of the Medical Faculty of Paris, and of the Academy of Science to Beaumont's book; and that extensive discussions of Beaumont's researches are contained in articles by Pierre-Honoré Bérard, and by Rullier and Raige-Delorme, published at Paris in 1835. Finally Miss Miller points out that Beaumont made attempts to have his book published immediately in London, but there was no interest in it among the booksellers.

" In the light of this new evidence," Miss Miller concludes, " it would appear that there was actually very little difference between the times of first notice of Beaumont's book in the three countries [Germany, England, France]. . . . The reviewer believes that Dr. Rosen's suggestion as to there being a selective factor at work in the various countries could not be established by studying only one author such as Beaumont, where it is not clearly demonstrated that the various countries were essentially different in their reception."

The present communication is intended to contribute further information to the reception of Beaumont's work in England and Ireland, to take issue with part of Miller's conclusion on the basis

[1] *Bulletin of the History of Medicine*, Vol. XIII (January), 1943, pp. 111-113.
[2] George Rosen, *The Reception of William Beaumont's Discovery in Europe*. New York: Schuman's, 1942.

of the information contained in her review as well as in these notes, and finally to present two interesting cases of the influence of Beaumont's researches on dietetics.

II

Since the publication of my study I have gathered five references to Beaumont's work in English medical literature which show that his researches became known in England and Ireland shortly after their publication. In the *Medico-Chirurgical Review* for 1834-1835 there appeared a twenty-page review of Beaumont's book.[3] This review is a reprint of the one that was published in the *American Journal of the Medical Sciences*. The reason for this action is explained by the editor in a footnote.

" Not having been able to procure a copy of Dr. Beaumont's work in time for this number of the journal," he says, " we have transferred to our columns an admirable analysis of it from a recent number of esteemed transatlantic contemporary, the ' American Journal of the Medical Sciences,' under the conviction that we could not offer our readers a more instructive article or a more acceptable present. We have only omitted a few introductory criticisms not essential to the analysis or the strictures of the reviewer." [4]

About two years later in 1836 the *Dublin Journal of Medical Science* published an article by Langston Parker, M. R. C. S. L. (Birmingham) entitled " Observations on Diseases of the Stomach, their Sympathies and Complications." [5] This is the same Langston Parker, whose book published in 1838 I had previously regarded as containing, with one exception, the first mention in English medical literature of Beaumont's investigations. In this article Parker refers twice to Beaumont. On one occasion he says that an opinion which he has expressed appears " to acquire great support from the experiments and observations lately made by Dr. Beaumont; " [6] and in the second reference Parker points out that " We know from

[3] *Medico-Chirurgical Review*, vol. 22, 1834-35, pp. 49-69.

[4] *Ibid.*, p. 49.

[5] Langston Parker, " Observations on Diseases of the Stomach, their Sympathies and Complications," *Dublin Journal of Medical and Chemical Science*, vol. VIII, 1836, pp. 31-66.

[6] *Ibid.*, p. 35.

the researches of Prout, Tiedemann, and Gmelin, and Dr. Beaumont, that the gastric juice during digestion contains free acetic and hydro-choric acids, and that these acids are furnished in greater quantity, in direct proportion to the more or less stimulating qualities of the food." [7]

In the same year Andrew Combe presented the first edition of his *Physiology of Digestion* containing references to the work of Beaumont. Combe's book was reviewed at length in the *British and Foreign Medical Review* for April-October 1836. In the course of the article the reviewer mentions Combe's references to Beaumont, at the same time injecting a disparaging note. "After speaking of the different functions of the nerves of the stomach," he says, " Dr. Combe devotes a considerable number of pages to the subject of the gastric juice. The strangeness of the case of Alexis St. Martin, related by Dr. Beaumont, of the United States, has apparently made a strong, and we could almost say, an undue impression on Dr. Combe's mind; for the results are not many or even altogether novel, while even the most candid reader views the marvelous narration, however unjustly, with a slight degree of incredulity." [8] The reviewer proceeds to narrate the history of St. Martin and of Beaumont's subsequent experiments, and concludes the discussion of this work with the following remarks. " In the imposing list of ' Inferences from Dr. Beaumont's Experiments and Observations,' (p. 140)," he says, " which contains no less than forty-five such alleged inferences, the medical reader will be surprised to find scarcely twelve that contain any novelty; and of these the greater part, if not all, appear to us to be of a very doubtful nature. . . . And, as regards the rest of the inferences, about thirty in number, they seem to us to relate to facts very commonly known and very generally admitted before Dr. Beaumont began his experiments. We admire the patience and zeal of the experimenter, but we protest against being carried away by the novelty of the experiments to declare every inference confirmed by them an actual discovery." [9]

Two years later (1838) the same journal reviewed Combe's

[7] *Ibid.*, p. 42.

[8] *British and Foreign Medical Review*, vol. II, 1836, p. 375. I owe this reference to the kindness of Miss Genevieve Miller.

[9] *Ibid.*, p. 377.

Edinburgh edition of Beaumont's book. The author of this review was much more favorable. He wrote: "We are very happy to welcome to this country a work which we cannot but regard as one of the most important practical contributions to the science of physiology which the growing attention to its pursuit has of late years elicited; important, not only in the bearing of the facts detailed in it upon the theoretical explanation of one of the most universal but least understood functions of the animal system, but also in the immediate applicability of the inferences directly deducible from them to the preservation of the human body in health, and its relief from some of the most distressing maladies to which it is subject. Although many of the most valuable of these inferences were embodied in Dr. Combe's excellent work on Digestion and Dietetics, yet we were still desirous that Dr. Beaumont's own experiments and observations should be laid before the English public; and, though we regret the delay which has occurred, we are not sorry that it has been the cause of their being introduced by an editor so judicious as Dr. Combe has shown himself to be." [10] The reviewer then goes on to relate St. Martin's story and to discuss in detail the experiments of Beaumont. He calls attention to the experiments of Müller and Schwann which were stimulated by Beaumont's work, and to the fact that they confirm Beaumont's conclusions as to the nature of the gastric digestion. We may suggest that it was evidence of this kind that helped to make British opinion more favorable to Beaumont's researches. The review ends by endorsing Combe's suggestion that St. Martin be brought to England for further investigation. "We cannot but hope," says the writer, "that, if the object be taken up by the influential members of our profession, and properly brought forward at the ensuing meeting of the British Association, it may be effectually accomplished. We are sure that there is not an enlightened member in the bright ranks of the profession who would not gladly contribute a small subscription, for a limited number of years, to aid any of our public bodies who, might, in the first instance advance a sufficient sum from their funds to get St. Martin conveyed to this country. In the event this laudible design being carried into effect, we know no individual to whom the task of superintending the ex-

[10] *British and Foreign Medical Review*, vol. VI, 1838, p. 173.

periments could be confided with greater confidence than to the accomplished and honorable editor of Dr. Beaumont's book." [11] As I have pointed out in my monograph this proposal actually was brought up at the meeting of the British Association, but the opposition was too great and nothing ever came of it.

In the same year, that is, two years after the appearance of Parker's article the *Dublin Journal* published an unsigned review of Beaumont's book, after it had been reissued by Andrew Combe at Edinburgh.[12] "This work, published in 1833," says the anonymous reviewer, "was first made known to European readers by an analysis of its contents in the American Journal of the Medical Sciences, which was transferred to the pages of the Medico-Chirurgical Review, and subsequently to those of the Dublin Journal; see Vol. VIII. At that time we were not in possession of any copy of the work. For the present edition, we are indebted to Dr. Combe, who, in a very well written preface, explains his reasons, both public and private, for putting the British public in possession of Dr. Beaumont's work." [13]

After a brief description of the nature of Beaumont's researches and of the circumstances under which they were carried out the Dublin reviewer gives his opinion of the work as a whole.

"We cannot help declaring it as our opinion," he asserts, "that this work has been over praised. We give the author the full credit of industry, and a desire for truth; but we think his mode of experimenting very defective, at least for a basis of final conclusions on the physiology of digestion. Many of his deductions, too, are founded on an insufficient experience, even of the imperfect method which he followed, and we read of many singular circumstances, which, if established, would go far in modifying our pathological motions, yet which are passed by with a bare notice. Thus, we read of the stomach being covered, in a very complicated experiment, with numerous white spots, or pustules, resembling coagulated lymph which were removed by a brisk calomel purge; what an important

[11] *Ibid.*, p. 181.

[12] *Dublin Journal of Medical and Chemical Science*, vol. XIII, 1838, pp. 500-508. I owe this reference to the kindness of Dr. Arno B. Luckhardt who called it to my attention.

[13] *Ibid.*, p. 500.

fact for our Abernethian, hepatic, chylopoietic, viscera-correcting practitioners." [14]

This unfavorable attitude is envinced at several points in the review. In discussing the results of Beaumont's researches the writer says: "Dr. Beaumont's work may be divided into two parts, the first of which is a sort of essay on the subject of digestion generally, in which there is a little new, and if we are to conclude that this essay is the result of the numerous experiments which follow in the second part, we must consider them as unnecessary, for really there is little here that we did not know before." [15] Again the reviewer refers to an experiment as "a burlesque on scientific investigation," and to Beaumont's "exceedingly loose style of experimenting." [16]

Finally, at the end of the review the writer reveals his bias which led him to take such an unfavorable attitude to Beaumont's experiments. "We shall not follow Dr. Beaumont further in his experiments;" he states, "but, before concluding this notice, we must observe, that a principal object of our author is to defend that theory of digestion which refers the changes of ailment in the stomach to a purely chemical process. We have always considered this doctrine as a very doubtful one, inasmuch as it seems greatly at variance with our more extended notions of physiology."

The reviewer then proceeds to raise certain objections to the extreme simplicity of the chemical theory of digestion as it had been put forth by Beaumont and others. "Those who maintain, like Dr. Beaumont, that the gastric juice is the sole agent of ventricular digestion, assume the existence of a combination possessing an extent of solvent powers for which there is neither proof nor analogy. This gastric juice, this general solvent, when examined, contains a little free acid, and some salts in a state of great dilution. Yet, according to the school of chemical physiologists, it is capable of dissolving an almost infinite variety of substances or combinations of substances. When we consider the extent of the catalogue of alimentary materials used by man, from the complicated dishes of the modern epicure to the clay balls of the Ottomacs, a catalogue including almost every article or organic, and many of inorganic products, the idea that *one solvent* could dissolve all appears utterly impossible. But it may

[14] *Ibid.*, pp. 500-501. [15] *Ibid.*, p. 504. [16] *Ibid.*, pp. 506-507.

be contended, that the composition of the gastric juice may vary. We answer, that there is no proof, nor shadow of a proof, that it varies according to the tribe or race of man; and if it varies according to the *aliment*, then the whole case is given up. We must then grant the stomach a discriminating power, and accord it higher properties than a vessel for a chemical solution in a fluid whose properties are constant and determinable by analysis."

These objections have been quoted in full because they raise valid questions which could not be answered without a knowledge of the basic composition of foods (protein, fat carbohydrate), and of the enzymatic mechanisms involved in digestion. Knowledge of the physiology of digestion was in its beginnings. Indeed, it was just at this time that Schwann on the basis of researches influenced in part of Beaumont, discovered the existence of pepsin.

Finally, the Dublin reviewer, aware that his argument could not be answered, concludes his article with a triumphant paean to vitalism. "But this leads to a still more important consideration: if there be this variety in secretion corresponding to the variety in aliment, the first step in digestion must occur where the alimentary molecule is in contact with the living tissue. This we believe to be the first point of digestion, the first step in the wonderful and still unintelligible process by which the property of life is communicated to what has no life. Without denying the occurrence of chemical actions, we believe that digestion is as much a vital process as respiration, secretion, or any other of the phenomena of the living body. The progress of physiology is towards vitalism, a progress ever opposed by the vain and uninformed; and nothing that Dr. Beaumont has written or observed, is calculated to shake our opinion, that the chemical theory of digestion is quite insufficient to explain the mysteries of this process." [17]

III

The question may now be raised as to the bearing of the facts mentioned by Miss Miller, as well as those contained in the preceding section on the description of the reception of Beaumont's work in Europe. Before proceeding to discuss this problem it must be made

[17] *Ibid.*, pp. 507-508.

clear that the term "reception" involves three aspects that should be differentiated. These are:

1. the *time* aspect, that is, the temporal interval which elapses between the appearance of the results of a scientific investigation and the date when they first receive notice elsewhere;

2. the aspect of *interaction*, by which is meant, the reaction which these results elicit in the places where, and among the groups to whom they become known. Interaction may manifest itself (a) qualitatively, that is, by the kind of reaction which is evoked, or (b) quantitatively, by the degree or intensity of interaction which results.

Now we can see more clearly how the facts presented by Miss Miller in her review, and in this communication bear on these problems. They show, as Miss Miller correctly points out, "that there was actually very little difference between the times of first notice of Beaumont's book in the three countries." In other words the time interval which elapsed between the appearance of Beaumont's book and the time of first notice in Germany, England and France were not very different.

Does this evidence, however, justify Miss Miller's further conclusion that "it is not clearly demonstrated that the various countries were essentially different in their reception?" The answer to this question must be an unqualified "No." Indeed, on the very basis of the information presented by Miss Miller, and in this communication, it may be said that there were definite differences between Germany, Britain, and France. The very fact that a translation of Beaumont's book appeared in Germany in 1834, while it was not reprinted in Britain until 1838, and a French translation was never published, is already indicative of a difference in *degree of interest*.

Furthermore, while French scientists did learn about Beaumont's work in 1834, and two articles mentioning his researches appeared in 1835, yet there does not seem to have been as much interest in the significance of his investigations as in Germany. The fact is that there still remains a gap of eight years, from 1835 to 1843 when Blondlot published his experiments, during which there does not seem to be any evidence that Beaumont's researches had exerted much influence on French physicians and scientists.

In Britain, on the other hand, there is somewhat more evidence

of interest. Three magazine reviews appeared from 1834 to 1838, of which one (*Medico-Chirurgical Review*) was simply a reprint from an American journal, while another (*Dublin Journal*) was unfavorable. The other early references to Beaumont's work in the English medical literature also exhibit differences as over against the German. Parker's article (1836) and book (1838) try to utilize Beaumont's work for clinical purposes, while Combe's interest is in the application of the information elicited by Beaumont to dietetics. There are no purely physiological researches, as in Germany, which show the influence of Beaumont. If we wish to express the difference between these three countries in their reaction to the investigations of William Beaumont in terms of degree of interest, we may say that the French exhibited *some* interest, the British showed *more* interest, while the *most* interest was manifested in Germany.[18] Nor can it be denied, I think, that the kind of reaction evoked varied in the different countries. In short, it may be said that the response evoked by Beaumont's work varied both qualitatively and quantitatively in Germany, Britain and France.

[18] This rather crude characterization is based upon the following quantitative index. If the publications mentioning Beaumont's work or showing the influence of his researches which appeared from 1834 to 1845 are listed for Germany, Britain, and France, we obtain the following tabulation:

Germany		Britain		France	
Year	No.	Year	No.	Year	No.
1833	1	1834-35	1	1835	2
1834	2	1835	1	1843	1
1834-35	1	1836	3		
1835	1	1838	2		
1836	3	1839	1		
1839	2	1840	1		
1840	1				
1842	1				
1843	1				
Total	13		9		3

This tabulation is based on the publications mentioned in my book, in Miss Miller's review, and in the present notes.

In explanation of these variations I had suggested the hypothesis of a selective factor determined by the social and cultural backgrounds operating in the various countries. Of course, this is only an hypothesis, but it certainly cannot be rejected simply on the fact that several countries learned about a scientific investigation at the same time. Perhaps, it should be made clear that by "selective factor" is meant the establishment or determination of the specific cultural set or pattern which channelizes scientific or medical interests in certain directions. In other words, to understand such variations we must try to understand them as a part of a total cultural configuration. Thus, in the case of Germany, in order to really understand the way in which Beaumont's work was received, the origin of the interests of Johannes Müller and his co-workers should be studied, or the relation of university organization to scientific work in Germany, Britain, and France ought to be investigated. It would be of interest to study the reception of Beaumont's work in the United States and to see whether it exerted any influence at all on clinical or physiological study in this country; or, to see to what extent it was utilized in the health movement that swept this country during the thirties of the nineteenth century. Only on the basis of such studies can the hypothesis of a selective cultural factor be tested. Furthermore, one may suggest that a very potent influence is the preexistence of an active group of scientists working on problems similar to that with which the new discovery is concerned. This is quite evident in the case of Müller and his co-workers.

IV

In this last section I wish to present briefly two instances where the studies of Beaumont were used in works on dietetics.

The first is a Boylston Prize Essay by Luther V. Bell published in 1836. It deals with the question of "What Diet Can Be Selected Which Will Ensure The Greatest Probable Health and Strength To The Laborer In The Climate Of New England? Quantity And Quality, And The Time And Manner Of Taking It, To Be Considered." This essay is a part of the literature which appeared during the thirties and forties and which concerned itself with the working and living conditions of the laboring class. We shall con-

sider it in more detail in a future paper to be devoted to the subject. Here we are concerned only with the fact that Bell makes rather extensive use of Beaumont's work, of which he expresses a very high opinion. "Although evidently not pursued with that systematic and scientific ingenuity which have characterized the investigations of the French physiologists," he says, " still these experiments have a degree of precision in detail, a *vraisemblance*, which, wherever they go, or however long they may exist, will never lose their value, as *facts*. (Opinionum commenta delet dies, naturae judicia confirmat. *Cicero, de Natura Deorum.*) The author is evidently unaccustomed to experiment for the purpose of book-making, or to warp the results to suit a peculiar theory on a new hypothesis. We shall draw considerably on his volume, for illustrations on what we deem the most important points of a code of dietetics." [19]

Bell refers to Beaumont's work in connection with the more rapid digestibility of animal food, the effects of overeating, the value of moderation in eating, the function of saliva and insalivation, and finally the necessity for proper mastication of the food.[20]

The second work containing references to Beaumont's research is a French volume bearing the curious and characteristically Gallic title, *Le cuisinier et le médecin ou l'art de conserver ou de rétablir sa santé par une alimentation convenable*. This book appeared in 1855. The title page announces that it was prepared under the direction of Mr. L.-M. Lombard, Docteur en médecine de la Faculté de Paris, but the preface is signed by L. Cumer, the publisher. The volume consists of two parts: the first deals with temperament and constitution, digestion, and the various classes of foods; the second part is a cook-book dictionary containing in alphabetical order information on the nature and preparation of various foods. The first section comprises 239 pages, the second 368. Beaumont's work is mentioned in the first section in connection with gastric digestion. In describing how gastric juice may be obtained to study its pro-

[19] Luther V. Bell, *A Dissertation on The Boylston Prize Question for 1835: "What Diet Can Be Selected Which Will Ensure The Greatest Probable Health And Strength to The Laborer In The Climate of New England? Quantity and Quality, And The Time And Manner Of Taking It, To Be Considered,"* Boston, 1836, p. 29.

[20] *Ibid.*, pp. 29, 33, 36-37, 39.

perties, the writer relates the story of Beaumont and St. Martin. Apparently the reference is not based on first-hand knowledge of Beaumont's book, but rather on the publication of Blondlot, as all direct quotations are made from it. In discussing the nature of the gastric juice and its mode of action, reference is again made to the investigations of Beaumont.[21]

The material presented above makes it clear that a great deal of information may still be obtained with regard to the reception and influence of Beaumont's work. This is probably most applicable to the United States. I believe that a study of the reception of William Beaumont's work in his native land would yield interesting and instructive results. Furthermore, if the same intensive study could be applied to other medical discoveries, our conception of the dynamics of the transmission and spread of medical knowledge would undoubtedly be greatly clarified.

[21] *Le cuisinier et le médecin ou l'art de conserver ou de rétablir sa santé par une alimentation convenable*, Paris, 1855, pp. 75-76.

BIBLIOGRAPHY OF THE HISTORY OF MEDICINE OF THE UNITED STATES AND CANADA—1942

Edited by GENEVIEVE MILLER

In this fourth annual Bibliography of the History of American Medicine * the number of items is even larger than in previous years. This does not necessarily mean that more books and articles were written during 1942, but simply that the Committee has been able to cover a larger volume of the literature published.

Some confusion has arisen concerning the contents of the Bibliography. It does not attempt, as some believe, to include all the recent books and articles on medical history in general. It is strictly limited to *American* medical history, to the history of American institutions and physicians. When books of a general character are included, it is because they contain a substantial amount of material on the American scene. And within the field of American medical history it includes only the history of the United States and Canada, since most of the Spanish American literature is not easily available.

This year some minor changes have been made in arranging the references. The section *Local History and Societies* has been subdivided into states for the convenience of the researcher; the section *Surgery* has been abandoned and such references are now included under *Medical Science and Specialties*. A new section *Primitive Medicine* has been added, as well as more cross-references. The Bibliography contains the following sections:

BIOGRAPHY (arranged alphabetically under the subjects of the biographies)
DENTISTRY (arranged alphabetically under authors of articles)
DISEASES
GENERAL
HOSPITALS
JOURNALS
LIBRARIES-MUSEUMS
LOCAL HISTORY AND SOCIETIES (arranged alphabetically according to states)

* Cf. *Bulletin of the History of Medicine*, 1940, Vol. 8, pp. 619-635; 1941, Vol. 9, pp. 436-467; 1942, Vol. 11, pp. 437-473. For earlier articles and books see Grace Gardner Griffin and Dorothy M. Louraine, *Writings on American History 1936*, Washington, D. C., 1941 (Vol. II of Annual Report of the American Historical Association for the Year 1936).

MEDICAL EDUCATION
MEDICAL SCIENCE AND SPECIALTIES
MILITARY MEDICINE
NURSING
PHARMACY
PRIMITIVE MEDICINE
PROFESSIONAL HISTORY
PUBLIC HEALTH AND SOCIAL MEDICINE

In sections without special subdivisions, books are listed first, followed by journal articles.

During the past year the Committee lost the services of two of its members, Col. Edgar Erskine Hume and Lt. Morris C. Leikind, who are on active Army duty. We were fortunate to obtain the help of Mr. Whitfield J. Bell, Jr. of the Department of History, Dickinson College, Carlisle, Pa. who covered the general historical literature. The present bibliography has been compiled by the following Committee members: Mr. Whitfield J. Bell, Jr., Dr. W. W. Francis, Mrs. Eva R. Hawkins, Miss Genevieve Miller, Miss Elizabeth E. Schramm, Dr. George Urdang, and Dr. Bernhard W. Weinberger. Preliminary proof sheets were sent to the librarian members of the Association for additions, and items were submitted by the following: Mr. Philip M. Benjamin, Dr. Wyndham B. Blanton, Miss Janet Doe, Dr. Jonathan Forman, Dr. Charles Frankenberger, Dr. Claudius F. Mayer, Dr. Henry R. Viets. Special mention must be made of the contributions of Miss Schramm, who as in the past, has been the chief source of most of the material.

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Lamps on the Prairie. A History of Nursing in Kansas. Compiled by the Writers' Program of the Work Projects Administration in the State of Kansas. Sponsored by the Kansas State Nurses' Association. Emporia, Kansas: Emporia Gazette Press, 1942. 292 pp., illustrated. $3.00.

In 1912 a small group of Wichita nurses launched a movement to organize the nurses of Kansas in order to raise the standards of education and to protect themselves from the influx of poorly trained nurses who, because of registration laws in other states, were moving into Kansas. The movement was successful and resulted in the Kansas State Nurses' Association which was recognized by the state legislature the following year. The necessary state board for examination and registration of nurses was created, and the initial goal of the Association thereby realized. Since its foundation, the organization has continued to exert itself in the highest interests of the profession. Nursing education is continually brought up to date and new courses added as conditions warrant them. Aware of the value of historical studies in showing modern students the basis of their profession and its present position, the history of nursing has been added to the curriculum. Furthermore, they have sponsored a project on the nursing history of their own state which was carried on by the Writers' Program of the Work Projects Administration in Kansas and resulted in this book.

The history of nursing in Kansas is woven into a background of the history of the state itself, of the early doctors and hospitals, of the epidemics, famines and wars. Beginning in 1541 when Coronado first entered the region, the narrative carries one through to the present: from the early pioneer days when there were no doctors or nurses and disease or accidents were treated by folk remedies, to 1861 when Kansas became a state and settlers came in ever larger numbers, to the Kansas of today. At first the sick were nursed by housewives of the community, later some women began to specialize in caring for the stricken, and in 1887 the first school for nurses was established in Axtell Hospital, a small private institution in Newton.

In the beginning nursing education was very irregular, and the students were used as cheap labor to perform every conceivable kind of task in the small understaffed hospitals. The concluding chapter of this book consists of a sketch of a day of duty of a hospital nurse in 1892 and in 1942, a forceful illustration of the tremendous progress of today.

An interesting chapter is that devoted to the history of the public health nurse with her ever increasing field of activity. Coupled with this is an outline of the history of public health in Kansas which was no exception to other regions in its inertia and unwillingness to promote sanitation, contagious disease control, and preventive medicine in general. Physicians as

well as the public had to be educated concerning the necessity of such measures, and the early nurses are worthy of the highest praise for their patience and endurance in the face of hostility and reaction. Although the first State Board of Health was established in 1885, it had very little power; only in 1917 can it be said that the basis was laid for a sound program with adequate personnel.

An appendix contains a list of all the various nursing schools which sprang up in Kansas with a brief historical sketch of each, followed by a useful "Chronology of progress in care of the sick and prevention of disease in Kansas."

One regrets that no documentation has been given, either as footnotes or as a terminal bibliography. With this omission the usefulness of the book as a tool of research is greatly limited. It is obvious that in a work of this sort much information must be obtained from personal communication and second hand anecdotes. But knowledge of that very fact is important for one who investigates a smaller phase of the state history. Important also are references to manuscript material, unpublished archives, or to newspaper articles, etc. Whereas in a book of this type only an outline of the entire picture can necessarily be given, that outline with proper documentation can be used as the starting point for more detailed studies. But the study quite capably fulfills the two-fold purpose expressed in its preface of "diffusing the influence and perpetuating the memory of those nurses whose life's work it presents."

GENEVIEVE MILLER

ELEANOR LEE. *History of the School of Nursing of the Presbyterian Hospital, New York 1892-1942.* New York: G. P. Putnam's Sons, 1942. 286 pp., 57 illustrations. $3.50.

Linking her complete knowledge of the Presbyterian Hospital with her equipment in the history of nursing, Miss Lee has made in this volume not alone a work of fascinating interest, but with its minute and accurate detail an outstanding tool of reference in the history of nursing and its profession as well. Evidence is everywhere apparent of unusual thoroughness in her search for material upon which to draw, and not only did she find it, but ample proof that she drew upon it shows clearly throughout the entire volume.

Chapter I is given mainly to the Presbyterian Hospital from its opening day on October 10th., 1872, before the establishment of the Training School for Nurses when middle aged women were employed as nurses who won their training through experience and help of doctors up to 1891, by which time the possibilities of nursing work had been so brought to the fore that decision was made to plan its own training school.

Chapter II is well devoted to the founding and early development of the

Training School for Nurses, opened May 1892, Miss Anna Caroline Maxwell having assumed duties as superintendent of nurses on January 1st of that year. With her marvellously loyal and never tiring service steady progress was maintained, this being continued in the same unselfish and tireless way by Miss Helen Young, who succeeded as director of the Nursing Service and the School of Nursing of the Presbyterian Hospital in 1923.

It would be no easy task to select a single item as excelling all others where entire ground is so completely covered, but the excellence of the entire book is easily seen through the contents and a very helpful index,—the latter making mention of the Florence Nightingale Memorabilia,—a collection of inspiring charm. The chapter on the Alumnae Association is likewise worthy of added mention, while A Chronological List of Events from 1892 to June 1942, so skillfully and helpfully done,—stands out as really unique.

Devotion and loyalty to duty by everyone are everywhere evident as the author has made of her work so worthy a contribution to her fine profession.

As to the format of the book, it is in fine keeping with its contents, and its contents make it a volume that all libraries—hospital, medical and public—as well as doctors and lay readers alike should not only want to read, but quite as much to possess.

ELIZABETH E. SCHRAMM.

HUTTON WEBSTER. *Taboo. A sociological study.* Stanford University, Cal.: Stanford University Press, 1942. 393 pp. $4.00.

Taboo transgression is regarded in primitive societies as one of the main causes of disease, epidemics and other evils. And, although in ways very different from those alleged by the primitives, it actually is very instrumental in the genesis of some cases of disease and death up to our own time and society.

It will thus be highly welcome to medical historians that Prof. Webster has collected with his well known industry the most important cases of taboo and taboo transgression. Prof. Webster also has fortunately sifted the more recent ethnographical literature which is particularly rich and so far had not yet been used in any previous surveying of the field (Frazer, Sumner and Keller, Marett, etc.).

Prof. Webster's book deals with taboos concerning the reproductive life, separation of sexes, sexual intercourse, death and the dead, strangers and strange phenomena, sacred persons and things, and the economic sphere. From an anthropological point of view many objections may be made to the book which uses the Frazerian "comparative" method and which in its rare theoretical statements shows the same, by now somewhat antiquated, Frazerian "rationalistic" spirit. E. g. to label taboos as "superstitions"

sounds somewhat odd to us nowadays. But these objections are of very minor importance to those who will use the book mainly as a reference book and then analyse by themselves the material pertinent to their problems which otherwise would be very difficult to find. The book is over-abundant with such data as that concerning the behavior towards ill and dying people, in birth accidents, concerning the therapeutic use of diet and confession, the purificatory function of emetics and purgatives, etc. The very fact that Prof. Webster defines taboos as "prohibitions which, when violated, produce automatically in the offender a state of ritual disability—"taboo sickness"—only relieved, when relief is possible, by a ceremony of purification" has induced him almost automatically to collect a solid corpus of facts of great medico-historical and medical interest.

ERWIN H. ACKERKNECHT

GREGORY BATESON and MARGARET MEAD. *Balinese Character, a photographic analysis.* Special Publications of The New York Academy of Sciences, Vol. II. New York: The Academy of Sciences, 1942. xii + 277 pp., 100 plates. $3.75.

There is probably no living anthropologist besides Margaret Mead who, without losing any of his scientific standards, has succeeded to the same large extent in interesting not only anthropologists in his work, but a larger public of psychologists, sociologists, psychopathologists, educators, etc. This time she gives us a 54 page study on the Balinese character which is intended as an "introductory description" to 759 photographs, made, arranged and commented upon by Gregory Bateson. The book is based on joint field work of both authors during the years 1936, '37, '38 and '39. An appended ethnographic note on Bali (pp. 256-263) will best be studied first, especially by those readers who have not yet come across one of the numerous, more popular books on Bali. These books, some of them very richly and beautifully illustrated, were the outcome of a strange fascination which Bali exerted, especially on the Germans of the twenties and the Americans of the thirties, and which reminded one very much of the "exotic dreams" of the 18th and 19th centuries, especially in France.

Dr. Mead emphasizes the continuous *orientation in time, space and status* (caste) as the essentials of social existence in Bali. Orientation is rather felt as a protection than as a strait jacket and its loss provokes extreme anxiety. This order allows a somewhat detached, dissolute and dreamy state of mind, the counter-pole of which is the intense concentration and otherwise never practised emotional exteriorization in *trance*. A detailed analysis of learning procedures—we remind the reader that Dr. Mead was the pioneer in the study of learning procedures in preliterate societies—reveals that learning is done

rather passively with one's muscles and eyes, by identification with the bodies of others, than by active verbal instruction.

The development of different attitudes towards eating, the production of *fear* as a major sanction and stimulus, and the production of emotional unresponsiveness, mainly by teasing of the mother, are described. The latter procedure makes for a parent-children relationship which is symbolized in the drama, the mother being the witch, the father, the benevolent dragon, the "children" turning their daggers against themselves in a state of trance. The peak of this "retirement" technique is the ability to sleep in the most fearful situations (e. g. court). The *Rites de passage* (especially puberty and burial rites) and the emotional consequences of the belief in reincarnation are analyzed. Leprosy, the "holy disease," is of special bearing to a people so enormously concerned with the body, its balance and integrity.

Dr. Bateson's photographs, highly interesting and beautiful, although the latter effect was by no means sought for, develop the same points of character development and structure. Most important to the medical anthropologist are the numerous photographs of trance states (which also go with a disturbance of pupillary reflexes), especially as we have only very few and certainly no better photographs of these states "psychopathologically" so important.

This is a very good book; but the reviewer would be unfaithful to his duties in stopping here and in omitting some critical remarks. It would be, of course, unfair to criticize that a 54 page treatise does not mention this or that. But it seems necessary to discuss some points of principle. The authors treat Bali as a preliterate society, disregarding the Hindu and Chinese influences and thus to a certain extent succeed in basing their study mostly on an actually illiterate village. But a society which has a written tradition is fundamentally nowhere preliterate, even in spots where people are actually illiterate. The shortcomings of this method become very obvious when, e. g., the important question of the attitude of the Balinese towards his body, the dissociation into small elements (isolated action of muscular groups) and the fundamental unit of the body on the other hand, is dealt with. This phenomenon can, in my opinion, never be fully understood without an analysis of its relations to the Hindu philosophies of macrocosm and microcosm, which are widespread, adopted and modified in Bali. The fear element in Balinese culture, which probably is the basis of that mastery of the body which made Bali so famous, is extensively discussed; but sometimes obvious clues such as the fear of spirits are neglected in favor of clues taken from the psychoanalytic scheme (phallus symbols, etc.) the absence of which was so refreshing in Dr. Mead's earlier books. The gay side is rather absent from the picture this book gives of the Balinese character. Dr. Mead has always experimented in methods and with great success. This book again, which puts the accent, not on the text, but on the 759 pictures, is an "experimental innovation" and the older books of the authors are regarded by them as comparatively imperfect,

the new method as more objective and easier to evaluate. The reviewer, although regarding this as a very good book, feels unable to adopt this point of view or to recommend a new method which seems to him based on a fundamental misunderstanding of the possibilities of pictures in the development of scientific thought. Even if the pictures would follow more closely the intended line of confronting analogous situations as they actually do, even if they would have the more perfect form of movies, they would never be able to replace a conceptual text. The time of pictography has passed. Confronted primarily with pictures, the reader will understand them anyway only after they have passed the filter of conceptual language. It is no advantage when this filtering is done partly in his brain instead of in the brain of the scientist who developed the problem, and the subjectivism of the scientist is eventually only better hidden, but not diminished. Pictures can be a great help to the word, but the word is the primary instrument of social science and will not be reduced to the mere handmaiden of the picture without harm. Of course in a time and culture where the trend is avoidedly "away from the written word" this new technique is extremely modern. But it is questionable if it is an improvement.

This said we would like to repeat that the book of Drs. Bateson and Mead is a most enlightening and beautiful one and the New York Academy of Sciences is very much to be congratulated for having given it to us in commemoration of its 125th birthday.

ERWIN H. ACKERKNECHT

STEPHEN P. MIZWA. *Nicholas Copernicus, 1543-1943.* New York: The Kosciuszko Foundation, 1943. 88 pp., illustrated. $.75.

On the occasion of the four hundredth anniversary of the publication of Copernicus' fundamental work, the Kosciuszko Foundation presents this brochure to commemorate the event. A brief account of Copernicus' life and work is given; and programs are suggested for public celebrations. The chief emphasis, however, is on Poland—the Poland of Copernicus' day, the present plight of the country, and discussions of plans for the cultural rebuilding of the country after the war. Attractive features of the book are the reproductions of old prints, paintings, and other works of art connected in one way or another with the life and times of Copernicus, and, on the cover, a fine portrait of the scientist by the modern Polish artist, Arthur Szyk.

One can readily understand the patriotic emphasis in the brochure. At the same time it is to be hoped that men will pay homage to Copernicus not as a representative of this or that nation but as a genius who could fix his center of reference not merely outside his own country but outside his own planet.

I. E. DRABKIN

ALFRED KORACH. *Extra-Mural Teaching of Preventive Medicine and Public Health.* Cincinnati, 1942. 143 pp. $1.50.

Dr. Korach's book is based on the experiences of the Department of Preventive Medicine of the University of Cincinnati (Head: Prof. Thomas J. LeBlanc). It describes in its first part the program of the Department, and gives extracts of numerous students' papers on their experiences in extra-mural teaching. In a second part, planning and arrangement of such programs, the correlation of extra and intra-mural teaching, an ideal program, etc., are more generally discussed. An extensive bibliography closes the volume.

The goal of this method is to familiarize the student, in the only efficient way: personal acquaintance, not only with the environmental problems of his future patients but also with the already existing health machinery. It embodies in Cincinnati about 35 items, such as visits to water works, slaughter houses, institutions for the physically handicapped, public relief institutions, Court of Domestic Relations, participation in the rounds of health nurses, health inspectors, district physicians, etc.

Dr. Korach's book will not only be a most welcome aid to those teaching public health and preventive medicine, but valuable reading to all interested in the future of medicine. 58 pages, mostly extracted from students' reports, make it a most encouraging sociologico-historical document. It is an old trick of painters to regard their pictures in a mirror in order to discover otherwise unobserved traits. The reflection of well known facts in these young brains has a similarly stimulating effect.

E. H. ACKERKNECHT

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